

Chapter 1 **Proposed Project**

1.1 Introduction

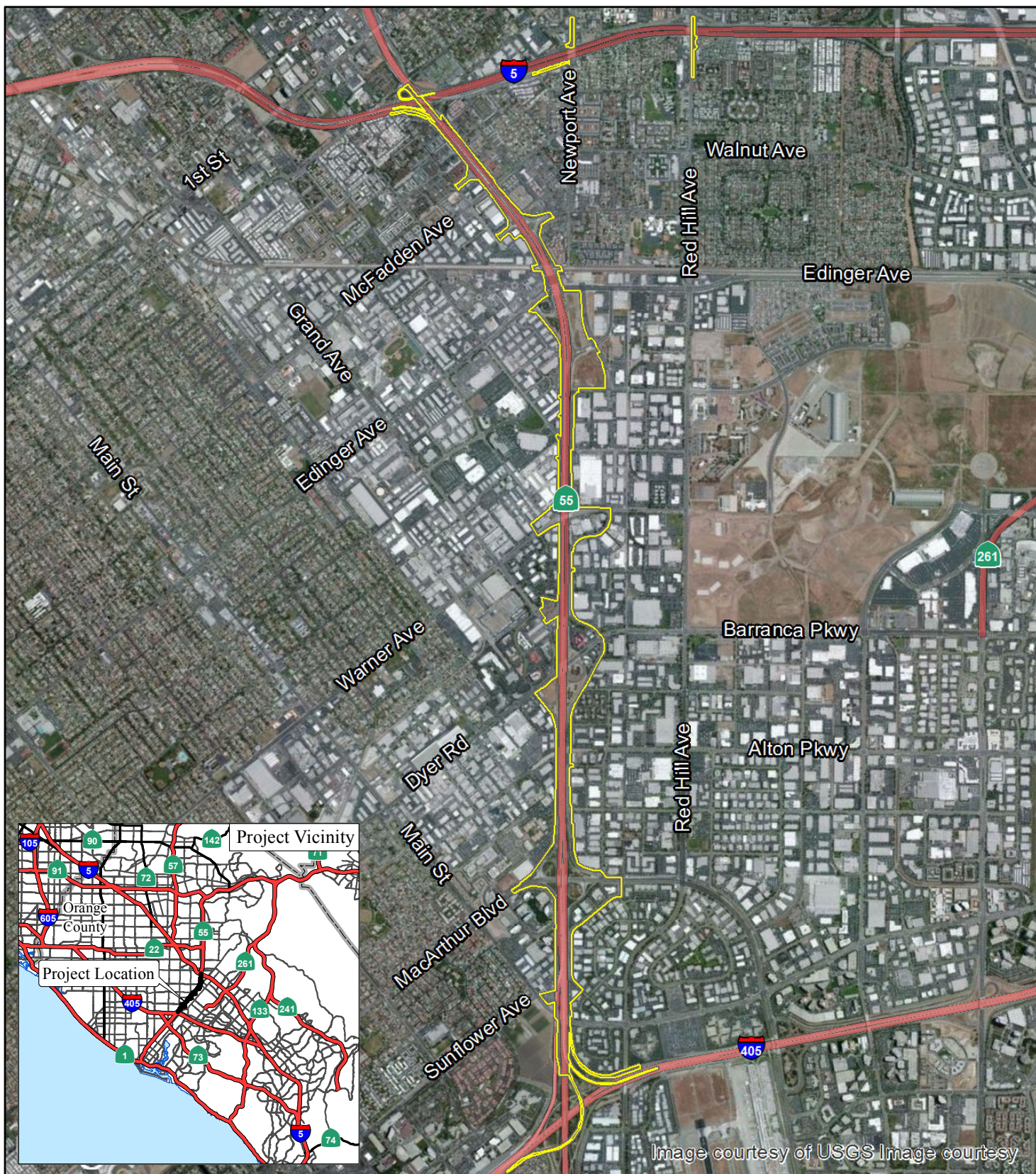
The California Department of Transportation (Caltrans) District 12, in cooperation with the Orange County Transportation Authority (OCTA), proposes to widen State Route 55 (SR-55) in both directions from just north of the Interstate 405 (I-405)/SR-55 Interchange to just south of the Interstate 5 (I-5)/SR-55 Interchange between Post Miles 6.4 and 10.3, traversing the cities of Santa Ana, Tustin, and Irvine in Orange County, California, as shown on Figure 1-1. Caltrans is the Lead Agency for compliance under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

The proposed project is in the Southern California Association of Governments (SCAG) financially constrained 2012–2035 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS), which was found to be conforming by the Federal Highway Administration (FHWA)/Federal Transit Administration (FTA) on June 4, 2012. The project is also in the 2015 Federal Transportation Improvement Program (FTIP), which was found to be conforming by the FHWA/FTA on December 14, 2012: “Project ID: ORA100511, Description: SR-55 widening between I-405 and I-5. Add one mixed flow lane in each direction and fix choke points from I-405 to I-5; add 1 aux lane in each direction between select on/off ramps through project limits.” Copies of the 2012 RTP and 2015 FTIP listings for the proposed project are provided in Appendix G, 2012 RTP and 2015 FTIP Project Listings.

1.1.1 Existing Facility

SR-55 is a major north-south freeway in central and coastal Orange County that extends from Finley Avenue, just south of State Route 1 (SR-1) in the City of Newport Beach, to SR-1 in the City of Anaheim and has interchanges with State Route 73 (SR-73) near the southern terminus, I-405, I-5, State Route 22 (SR-22), and State Route 91 (SR-91) in the north. SR-55 is a main travel route to residential, commercial, and retail areas in central and coastal Orange County, John Wayne Airport (JWA), and the beaches and tourist attractions in the coastal cities.

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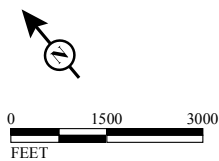
LEGEND

— Project Limits

FIGURE 1-1

*State Route 55 (SR-55) Improvement Project between
Interstate 405 (I-405) and Interstate 5 (I-5)*

Project Location Map



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SR-55 was originally constructed in 1962 as a four-lane freeway with two general-purpose lanes in each direction. Over the next 10 years, one additional general-purpose lane was added in each direction. In 1985, the median was paved and the freeway was restriped to provide one high-occupancy vehicle (HOV) lane in each direction. In 1992, SR-55 was extended from Mesa Drive to 19th Street in Costa Mesa. HOV direct connectors were added at the I-5/SR-55 Interchange to connect southbound I-5 HOV traffic to southbound SR-55 and to connect northbound SR-55 HOV traffic to northbound I-5, and an additional general-purpose lane was constructed in each direction between SR-22 and McFadden Avenue in 1995. Between 1996 and 2002, one additional general-purpose lane was added in each direction between I-5 and SR-91. In 2005, HOV direct connectors were added at the I-405/SR-55 Interchange to connect southbound SR-55 HOV traffic to I-405 and to connect I-405 HOV traffic to northbound SR-55.

In general, the project segment of SR-55 currently consists of one HOV lane and four general-purpose lanes in each direction, with auxiliary lanes provided at some locations as shown on Figure 1-2. The HOV lanes currently operate with continuous access. All the on-ramps along the project segment of SR-55 are currently metered.

1.2 Purpose and Need

The project purpose is a set of objectives the project intends to meet. The project need is the transportation deficiency that the project was initiated to address.

1.2.1 Purpose

The purpose of the proposed action is to:

- Improve mobility and reduce congestion;
- Improve traffic operations; and
- Increase capacity.

1.2.2 Need

Current deficiencies of SR-55 within the project limits are as follows:

- Limited available lane capacity during peak periods
- Inadequate merging distances as a result of closely spaced on- and off-ramps along the freeway mainline
- Non-standard lane and shoulder widths at some locations

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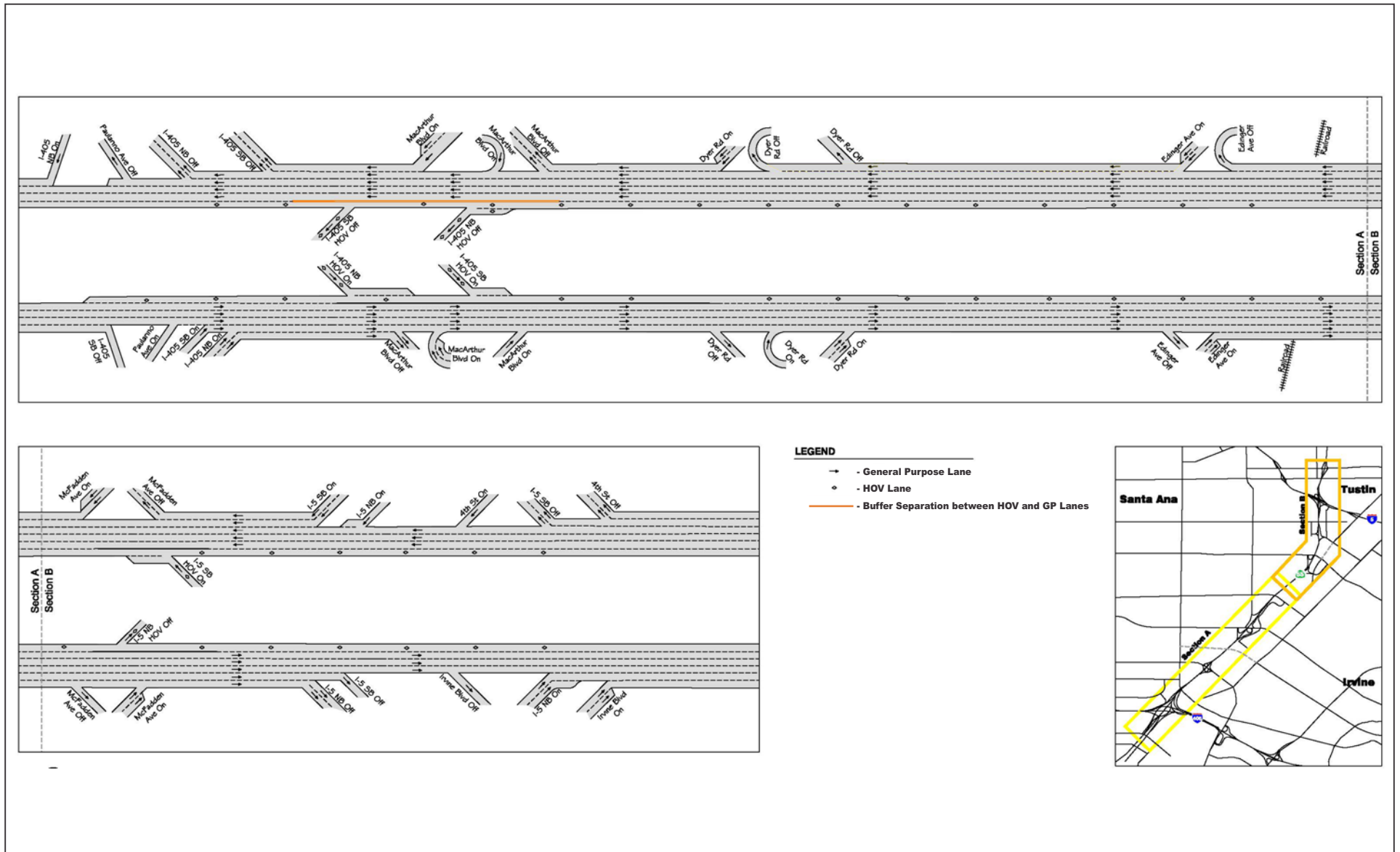


FIGURE 1-2



NOT TO SCALE

SOURCE: FEHR & PEERS (Jan. 2013)

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State Route 55 (SR-55) Improvement Project between
Interstate 405 (I-405) and Interstate 5 (I-5)

Existing SR-55

12-ORA-55 PM 6.4/10.3

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1.2.2.1 Capacity, Transportation Demand, and Safety

Capacity and Transportation Demand in the SR-55 Corridor

Levels of Service

Freeway traffic flow can be defined in terms of levels of service (LOS). For freeways, there are six defined LOS, ranging from LOS A to LOS F. LOS A represents free traffic flow with low traffic volumes and high speeds, and LOS F represents traffic volumes that exceed the facility capacity and result in forced flow operations at low speeds, as shown on Figure 1-3. As shown on Figure 1-3, traffic volumes on a facility such as SR-55 substantially affect travel speeds and times.

Table 1.1 provides information on the existing (year 2011) traffic volumes in numbers of vehicles traveling on mixed-flow segments of northbound and southbound SR-55 during the AM peak hour and PM peak hour, and the average daily traffic (ADT) on those segments. Traffic volumes are also shown for the No Build Alternative in 2020 and 2040. As shown, there is strong directionality in traffic demand, generally with higher traffic volumes southbound in the AM peak hour and northbound in the PM peak hour in all three scenarios.

Table 1.2 provides the LOS for the existing condition and the No Build Alternative in 2020 and 2040 on the SR-55 mainline during the AM and PM peak hours. Consistent with traffic volumes shown in Table 1.1 and the travel times and speeds discussed later in this section, the poorest LOS (E and F) in 2011 occurred on southbound SR-55 in the AM peak hour and on northbound SR-55 in the PM peak hour.

Under the No Build Alternative in 2020 and 2040, the poorest LOS would still occur on southbound SR-55 in the AM peak hour and on northbound SR-55 in the PM peak hour although the LOS in the other directions on SR-55 in those peak hours would also be degraded compared to existing conditions. As a result, without substantial improvements, a majority of the study segments on northbound and southbound SR-55 would operate at LOS E and F during AM and PM peak hours by 2020 and 2040.

Table 1.1 Existing (2011), and 2020 and 2040 No Build Alternative Mainline Traffic Volumes

Freeway Segment	Direction	Existing Conditions (2011)			Future Conditions (2020)			Future Conditions (2040)		
		AM Peak Hour	PM Peak Hour	ADT	AM Peak Hour	PM Peak Hour	ADT	AM Peak Hour	PM Peak Hour	ADT
Paularino Ave to I-405 (Mainline)	NB	6,914	4,456	75,608	7,150	4,470	77,360	7,500	4,200	79,955
	SB	8,073	8,627	92,288	8,175	8,875	94,900	7,995	9,235	98,500
I-405 to MacArthur Blvd (Mainline)	NB	7,949	7,189	112,361	8,165	7,185	114,110	8,530	7,110	117,655
	SB	9,901	9,497	121,192	9,940	9,675	123,590	10,050	10,140	129,195
MacArthur Blvd to Dyer Rd (Mainline)	NB	7,180	8,151	113,814	7,415	8,140	115,150	7,775	8,015	116,745
	SB	10,582	8,727	120,747	10,590	8,905	122,940	10,680	9,280	126,570
Dyer Rd to Edinger Ave (Mainline)	NB	6,741	9,760	118,456	7,020	9,725	119,300	7,330	9,420	118,570
	SB	10,774	8,382	127,169	10,980	8,595	129,340	11,000	8,940	132,280
Edinger Ave to McFadden Ave (Mainline)	NB	7,153	10,743	124,460	7,385	10,635	125,505	7,585	10,230	124,460
	SB	10,644	8,037	126,673	10,550	8,215	129,515	10,340	8,430	132,475
McFadden Ave to I-5 (Mainline)	NB	7,585	11,250	129,155	7,920	11,180	131,820	8,460	11,415	139,380
	SB	10,163	8,124	102,024	10,190	8,375	104,885	10,440	8,965	112,705
I-5 to Irvine Blvd (Mainline)	NB	5,504	11,052	111,397	6,075	11,080	116,570	8,070	12,855	137,970
	SB	7,486	6,498	80,554	7,655	6,865	86,220	9,060	8,510	107,385
I-405 to MacArthur Blvd (HOV)	NB	385	536	5,245	430	560	5,330	465	485	4,835
	SB	796	838	8,681	795	880	9,075	680	910	9,265
MacArthur Blvd to Dyer Rd (HOV)	NB	761	1,239	11,169	995	1,440	12,785	985	1,405	13,080
	SB	1,147	1,193	12,432	1,415	1,380	13,590	1,305	1,355	13,855
Dyer Rd to Edinger Ave (HOV)	NB	905	1,303	12,331	1,160	1,505	14,080	1,190	1,545	14,845
	SB	1,569	1,278	14,183	1,675	1,486	15,540	1,730	1,495	16,225
Edinger Ave to McFadden Ave (HOV)	NB	898	1,826	16,767	1,175	2,100	18,545	1,285	2,300	19,315
	SB	2,021	1,533	15,360	2,405	1,765	16,715	2,545	1,850	17,400
McFadden Ave to I-5 (HOV)	NB	321	1,108	7,586	375	1,115	7,750	405	845	6,790
	SB	1,291	688	8,553	1,370	735	8,920	1,135	755	8,260
I-5 to Irvine Blvd (HOV)	NB	325	1,184	8,108	375	1,255	8,680	440	1,025	8,060
	SB	1,316	672	7,968	1,315	750	8,495	1,140	845	8,610

Source: *Final Traffic Operations Report* (2015).

Note: "Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes. The AM peak hour is 8:00 to 9:00 a.m. The PM peak hour is 5:00 to 6:00 p.m.

ADT = average daily traffic

HOV = high-occupancy vehicle

Ave = Avenue

NB = northbound

Blvd = Boulevard

Rd = Road

I-5 = Interstate 5

SB = southbound

I-405 = Interstate 405







<h1>LEVELS OF SERVICE</h1> <p>for Freeways</p>			
Level of Service	Flow Conditions	Operating Speed (mph)	Technical Descriptions
A		70	Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. No delays
B		70	Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. No delays
C		67	Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful making lane changes. Minimal delays
D		62	Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. Minimal delays
E		53	Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. Significant delays
F		<53	Very congested traffic with traffic jams, especially in areas where vehicles have to merge. Considerable delays

Figure 1-3 LOS Thresholds for a Basic Freeway Segment

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**Table 1.2 Existing (2011), and 2020 and 2040 No Build Alternative
Freeway Mainline Levels of Service on Northbound and
Southbound SR-55**

Mainline Location ¹	2011		2020		2040	
	AM Peak Hour LOS	PM Peak Hour LOS	AM Peak Hour LOS	PM Peak Hour LOS	AM Peak Hour LOS	PM Peak Hour LOS
Northbound						
Paularino Ave merge	E	F	F	F	F	F
SB I-405 merge	D	F	D	F	D	F
NB I-405 on-ramp weave	E	F	C	F	D	F
MacArthur Blvd off-ramp weave	E	F	C	F	D	F
MacArthur Blvd merge (EB)	D	F	D	F	D	F
MacArthur Blvd merge (WB)	D	F	D	F	D	F
Dyer Rd diverge	D	F	D	F	D	F
Dyer Rd merge (EB)	D	F	C	F	D	F
Dyer Rd merge (WB)	D	F	D	F	D	F
Dyer Rd to Edinger Ave	D	F	D	F	D	F
Edinger Ave diverge	D	F	D	F	D	F
Edinger Ave on-ramp weave	E	F	D	F	C	F
McFadden Ave off-ramp weave	E	F	D	F	C	F
McFadden Ave on-ramp weave	F	F	E	F	E	F
NB I-5 off-ramp weave	F	F	E	F	E	F
SB I-5 diverge	B	F	B	F	C	F
Irvine Blvd diverge	B	F	B	F	C	F
NB I-5 merge	B	F	B	F	D	F
Southbound						
SB I-5 diverge	F	C	F	C	F	E
4 th St merge	F	C	F	C	F	F
NB I-5 merge	F	D	F	D	F	F
SB I-5 on-ramp weave	F	D	F	D	E	F
McFadden Ave off-ramp weave	F	D	F	D	E	F
McFadden Ave on-ramp weave	F	D	F	C	E	E
Edinger Ave off-ramp weave	F	D	F	C	E	E
Edinger Ave merge	F	D	D	D	D	F
Edinger Ave to Dyer Rd	D	D	D	D	D	F
Grand Ave diverge	E	F	D	D	D	F
Dyer Rd diverge	D	E	F	F	F	F
Dyer Rd on-ramp weave	D	D	D	F	E	F
MacArthur Blvd off-ramp weave	D	D	D	F	E	F
MacArthur Blvd merge weave (WB)	D	D	E	F	E	F
MacArthur Blvd on-ramp weave (EB)	C	E	D	D	D	D
SB I-405 off-ramp weave	C	E	D	D	D	D
NB I-405 diverge	C	D	D	D	C	D
Paularino Ave diverge	C	D	D	D	C	D

Source: *Final Traffic Operations Report* (2015).

Notes: ■ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes. The AM peak hour is 8:00 to 9:00 a.m. The PM peak hour is 5:00 to 6:00 p.m.

¹ merge = on-ramp junction, diverge = off-ramp junction

Ave = Avenue

Blvd = Boulevard

EB = eastbound

I-5 = Interstate 5

I-405 = Interstate 405

LOS = levels of service

NB = northbound

Rd = Road

SB = southbound

St = Street

WB = westbound

Table 1.3 shows the existing condition (2011), and 2020 and 2040 No Build Alternative LOS on the HOV lanes on SR-55. As shown, a majority of the study segments of the HOV lanes currently operate at acceptable LOS in both directions during both peak-hour periods, with LOS E and F occurring only at limited locations. However, as shown in Table 1.3, by 2020 and 2040 under the No Build Alternative, the LOS on the HOV lanes will be degraded, with more segments operating at LOS D, E, and F compared to existing conditions.

Travel Times and Speeds

The LOS on freeways characterize the performance of the freeway in terms of both travel times and speed. Table 1.4 summarizes the peak-hour travel times and speeds on northbound and southbound segments of SR-55 for existing conditions (2011) and the No Build Alternative in 2020 and 2040. There is strong directionality in the traffic volumes and congestion between the AM and PM peak hours and directions that are clearly reflected in the travel times and speeds. As shown in Table 1.4, the higher travel times and lower travel speeds in all three scenarios would occur on southbound SR-55 in the AM peak hour and northbound SR-55 in the PM peak hour.

Table 1.5 summarizes the peak-hour speeds on northbound and southbound HOV segments of SR-55 for the No Build Alternative in 2020 and 2040. As shown in Table 1.5, the lower travel speeds would generally occur on southbound SR-55 in the AM peak hour and northbound SR-55 in the PM peak hour.

Accidents and Safety in the SR-55 Corridor

Accident data for the project segment of SR-55 were provided by Caltrans for the 3-year period from April 1, 2007, to March 31, 2010. As shown in Table 1.6, a total of 1,447 accidents occurred on the project segment of SR-55 including the on- and off-ramps between April 2007 and March 2010. The majority of the accidents (87 percent) occurred on the SR-55 mainline and 13 percent occurred at the on- and off-ramps. Approximately 45 percent of the accidents occurred during the PM peak hour between 3:00 p.m. and 7:00 p.m. As shown in Table 1.7, the accident rates at the 17 locations were higher than the statewide averages for total accidents and/or total fatality and injury accidents for similar facilities.

**Table 1.3 Existing (2011), and 2020 and 2040 No Build Alternative
HOV Lane Levels of Service**

Freeway HOV Segment	2011		2020		2040	
	AM Peak Hour LOS	PM Peak Hour LOS	AM Peak Hour LOS	PM Peak Hour LOS	AM Peak Hour LOS	PM Peak Hour LOS
Northbound						
I-405 to MacArthur Blvd	A	A	A	A	A	A
MacArthur Blvd to Dyer Rd	B	C	B	C	B	C
Dyer Rd to Edinger Ave	B	F	B	E	B	F
Edinger Ave to McFadden Ave	B	F	B	E	B	E
McFadden Ave to I-5	A	B	A	B	A	B
Southbound						
I-5 to McFadden Ave	E	A	F	A	F	C
McFadden Ave to Edinger Ave	E	C	D	C	D	C
Edinger Ave to Dyer Rd	D	C	D	C	C	D
Dyer Rd to MacArthur Blvd	B	B	C	C	B	D
MacArthur Blvd to I-405	B	B	B	B	B	B

Source: *Final Traffic Operations Report* (2015).

Notes: ■ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes. The AM peak hour is 8:00 to 9:00 a.m. The PM peak hour is 5:00 to 6:00 p.m.

Ave = Avenue

Blvd = Boulevard

I-5 = Interstate 5

I-405 = Interstate 405

LOS = levels of service

Rd = Road

**Table 1.4 Summary of Peak-Hour Travel Times and Speeds for
General-Purpose Lanes**

Location (Distance Traveled)	AM Peak Hour		PM Peak Hour	
	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)
Existing Conditions (2011)				
NB SR-55 from Paularino Ave to Irvine Blvd (5.4 mi)	6:21	51.3	17:28	18.6
SB SR-55 from Irvine Blvd to Paularino Ave (5.4 mi)	9:16	35.1	5:24	60.3
2020 No Build Alternative				
NB SR-55 from Paularino Ave to Irvine Blvd (5.4 mi)	05:53	55.3	19:27	16.7
SB SR-55 from Irvine Blvd to Paularino Ave (5.4 mi)	08:21	39.0	06:25	50.7
2040 No Build Alternative				
NB SR-55 from Paularino Ave to Irvine Blvd (5.4 mi)	06:13	52.4	22:19	14.6
SB SR-55 from Irvine Blvd to Paularino Ave (5.4 mi)	07:59	40.8	09:40	33.7

Source: *Final Traffic Operations Report* (2015).

Note: "Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes. The AM peak hour is 8:00 to 9:00 a.m. The PM peak hour is 5:00 to 6:00 p.m.

Ave = Avenue

Blvd = Boulevard

min:sec = minutes:seconds

mi = miles

mph = miles per hour

NB = northbound

SB = southbound

SR-55 = State Route 55

Table 1.5 Summary of Travel Speeds for HOV Freeway Segments

Freeway HOV Segment	Existing (2011)		2020		2040	
	AM Peak Hour Speed (mph)	PM Peak Hour Speed (mph)	AM Peak Hour Speed (mph)	PM Peak Hour Speed (mph)	AM Peak Hour Speed (mph)	PM Peak Hour Speed (mph)
Northbound						
I-405 to MacArthur Blvd	64.5	56.5	64	60	64	60
MacArthur Blvd to Dyer Rd	60.0	32.4	67	63	67	62
Dyer Rd to Edinger Ave	59.6	37.8	66	41	66	33
Edinger Ave to McFadden Ave	60.7	38.8	66	42	66	38
McFadden Ave to I-5	61.1	41.4	67	66	66	64
Southbound						
I-5 to McFadden Ave	48.9	55.1	8	66	10	47
McFadden Ave to Edinger Ave	49.0	54.1	60	57	60	53
Edinger Ave to Dyer Rd	60.1	59.7	63	63	63	47
Dyer Rd to MacArthur Blvd	67.9	67.7	63	60	63	52
MacArthur Blvd to I-405	66.7	66.6	67	66	67	66

Source: *Final Traffic Operations Report* (2015).

Notes: "Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes. The AM peak hour is 8:00 to 9:00 a.m. The PM peak hour is 5:00 to 6:00 p.m.

The SR-55 HOV speed data were obtained from the Caltrans Performance Measurement System (PeMS) database.

Ave = Avenue

Blvd = Boulevard

HOV = high-occupancy vehicle

I-405 = Interstate 405

I-5 = Interstate 5

mph = miles per hour

Rd = Road

SR-55 = State Route 55

Table 1.6 SR-55 Accident History (April 1, 2007–March 31, 2010)

Location	Total Accidents	Total Fatalities	Total Fatalities & Injuries	Total Accident Rate ¹		Total Fatality and Injury Accident Rate ¹	
				Actual	Statewide Average	Actual	Statewide Average
Northbound SR-55							
NB SR-55 on-ramp from SB I-405	20	0	4	0.59	0.60	0.12	0.20
NB SR-55 between the I-405 underpass and the NB off-ramp to MacArthur Blvd	72	0	20	0.76	1.01	0.21	0.31
NB SR-55 between the NB on-ramp from SB I-405 and the NB on-ramp from WB MacArthur Blvd	125	0	30	2.45	1.02	0.59	0.31
NB SR-55 on-ramp from NB I-405	4	0	0	0.20	0.35	0.00	0.11
NB SR-55 off-ramp to MacArthur Blvd	10	0	3	0.51	1.20	0.15	0.42
NB SR-55 on-ramp from EB MacArthur Blvd	7	0	4	0.75	0.70	0.43	0.20
NB SR-55 between the NB on-ramp from WB MacArthur Blvd and the NB off-ramp to Dyer Rd	19	0	9	0.36	1.05	0.17	0.32
NB SR-55 between the NB off-ramp to Dyer Rd and the NB on-ramp from WB Grand Ave/Dyer Rd	120	0	32	1.52	1.15	0.41	0.35
NB SR-55 on-ramp from WB MacArthur Blvd	3	0	1	0.20	0.65	0.07	0.20
NB SR-55 off-ramp to Dyer Rd	6	0	2	0.50	1.20	0.17	0.42
NB SR-55 on-ramp from EB Dyer Rd	1	0	0	0.08	0.70	0.00	0.20
NB SR-55 between the NB on-ramp from Grand Ave/Dyer Rd and the Warner Ave underpass	36	0	10	0.87	1.10	0.24	0.34
NB SR-55 between the Warner Ave underpass and the NB off-ramp to Edinger Ave	44	0	15	0.61	1.11	0.21	0.34
NB SR-55 on-ramp from WB Dyer Rd	6	0	3	0.45	0.65	0.22	0.20
NB SR-55 between the NB off-ramp to Edinger Ave and the NB on-ramp from Edinger Ave	15	0	6	0.34	1.10	0.14	0.34
NB SR-55 between the NB on-ramp from Edinger Ave and the NB off-ramp to McFadden Ave	44	0	14	1.07	1.04	0.34	0.30
NB SR-55 between the NB off-ramp to McFadden Ave and the NB on-ramp from McFadden Ave	30	0	6	0.86	1.01	0.17	0.29
NB SR-55 between the NB on-ramp from McFadden Ave and the NB off-ramp to I-5	92	0	30	3.09	1.00	1.01	0.29
NB SR-55 off-ramp to Edinger Ave	8	0	3	1.26	1.20	0.47	0.42
NB SR-55 on-ramp from Edinger Ave	9	0	3	0.55	0.80	0.18	0.80
NB SR-55 off-ramp to McFadden Ave	3	0	1	0.43	0.85	0.14	0.26
NB SR-55 on-ramp from McFadden Ave	10	0	3	0.91	0.45	0.27	0.14
NB SR-55 between the NB off-ramp to NB I-5 and the NB off-ramp to SB I-5	30	0	11	0.58	1.11	0.21	0.33
NB SR-55 off-ramp to NB I-5	15	0	1	0.28	0.60	0.02	0.20
NB SR-55 off-ramp to SB I-5	8	0	1	0.55	0.45	0.07	0.15
Total NB SR-55 between the SB off-ramp to John Wayne Airport and the NB off-ramp to SB I-5	627	0	183	1.06	1.07	0.26	0.32

Table 1.6 SR-55 Accident History (April 1, 2007–March 31, 2010)

Location	Total Accidents	Total Fatalities	Total Fatalities & Injuries	Total Accident Rate ¹		Total Fatality and Injury Accident Rate ¹	
				Actual	Statewide Average	Actual	Statewide Average
Southbound SR-55							
SB SR-55 on-ramp from SB I-5	36	0	10	0.58	0.45	0.16	0.15
SB SR-55 between the I-5 on-ramp and the NB off-ramp from I-5	34	0	7	1.12	1.18	0.23	0.36
SB SR-55 between the SB on-ramp from I-5 and the SB off-ramp to McFadden Ave	124	0	35	2.67	1.00	0.75	0.29
SB SR-55 off-ramp from McFadden Ave	5	0	2	0.59	0.95	0.23	0.28
SB SR-55 on-ramp from McFadden Ave	3	0	1	0.39	0.55	0.13	0.16
SB SR-55 off-ramp to Edinger Ave	7	0	2	0.45	1.10	0.13	0.36
SB SR-55 on-ramp from Edinger Ave	5	0	1	0.62	0.75	0.12	0.26
SB SR-55 between the SB off-ramp to McFadden Ave and the SB on-ramp from McFadden Ave	32	0	6	1.30	1.01	0.24	0.29
SB SR-55 between the SB on-ramp from McFadden Ave and the SB off-ramp to Edinger Ave	36	0	5	0.95	1.01	0.13	0.29
SB SR-55 between the SB off-ramp to Edinger Ave and the SB on-ramp from Edinger Ave	54	0	9	1.15	1.09	0.19	0.33
SB SR-55 between the SB on-ramp from Edinger Ave and the Warner Ave overpass	45	0	11	0.54	1.11	0.13	0.34
SB SR-55 off-ramp to WB Grand Ave/Dyer Rd	0	0	0	0.00	1.20	0.00	0.42
SB SR-55 between the Warner Ave overpass and the SB off-ramp to WB Grand Ave/Dyer Rd	29	0	10	0.75	1.10	0.26	0.34
SB SR-55 between the SB off-ramp to WB Grand/Dyer Rd and the SB off-ramp to Dyer Rd	55	0	16	1.05	1.11	0.31	0.34
SB SR-55 off-ramp to EB Dyer Rd	4	0	3	0.48	1.20	0.36	0.34
SB SR-55 on-ramp from Dyer Rd	3	0	1	0.22	0.75	0.07	0.26
SB SR-55 off-ramp to MacArthur Blvd	8	0	2	0.43	1.20	0.11	0.42
SB SR-55 between the SB off-ramp to Dyer Rd and the on-ramp from Dyer Rd	52	0	14	1.51	1.19	0.41	0.37
SB SR-55 between the SB on-ramp from Dyer Rd and the SB off-ramp to MacArthur Blvd	16	0	4	0.35	1.05	0.09	0.32
SB SR-55 on-ramp from WB MacArthur Blvd	3	0	2	0.48	0.70	0.32	0.20
SB SR-55 between the SB off-ramp to MacArthur Blvd and the SB on-ramp from WB MacArthur Blvd	75	0	18	1.54	1.04	0.37	0.32
SB SR-55 on-ramp from EB Mac Arthur Blvd	3	0	1	0.22	0.65	0.07	0.20
SB SR-55 off-ramp to SB I-405	8	0	4	0.40	0.60	0.20	0.20
SB SR-55 between the SB on-ramp from WB MacArthur Blvd and the SB on-ramp to SB I-405	30	0	10	0.67	0.94	0.22	0.28

Table 1.6 SR-55 Accident History (April 1, 2007–March 31, 2010)

Location	Total Accidents	Total Fatalities	Total Fatalities & Injuries	Total Accident Rate ¹		Total Fatality and Injury Accident Rate ¹	
				Actual	Statewide Average	Actual	Statewide Average
SB SR-55 between the SB off-ramp to SB I-405 and the NB on-ramp from NB I-405	15	0	5	0.65	1.03	0.22	0.32
SB SR-55 between the NB on-ramp from NB I-405 and the I-405 overpass	28	0	4	0.85	1.08	0.12	0.34
Total SB SR-55 between the NB off-ramp to SB I-5 and the SB off-ramp to John Wayne Airport	625	0	154	1.06	1.07	0.26	0.32
TOTAL NORTHBOUND AND SOUTHBOUND	1,447	0	395	N/A	N/A	N/A	N/A

Source: *Final Traffic Operations Report* (2015).

¹ ■ indicates an accident rate on SR-55 that is higher than the statewide average accident rate. For mainline sections, the accident rate is the number of accidents per million vehicle miles. For ramps, the accident rate is the number of accidents per million vehicles.

Ave = Avenue

Blvd = Boulevard

EB = eastbound

I-405 = Interstate 405

I-5 = Interstate 5

N/A = not applicable

NB = northbound

Rd = Road

SB = southbound

SR-55 = State Route 55

WB = westbound

Table 1.7 Accident Rates on SR-55 Higher than the Statewide Average for Similar Facilities

Accident Location	Comparison to the Statewide Average Rate for Total Accidents	Comparison to the Statewide Average Rate for Total Fatality and Injury Accidents
Northbound SR-55		
NB SR-55 between the NB on-ramp from SB I-405 and the NB on-ramp from WB MacArthur Blvd	About 140% higher	About 90% higher
NB SR-55 on-ramp from EB MacArthur Blvd	About 7% higher	About 115% higher
NB SR-55 between the NB off-ramp to Dyer Rd and the NB on-ramp from WB Grand Ave/Dyer Rd	About 32% higher	About 17% higher
NB SR-55 on-ramp from WB Dyer Rd	About --% higher	About 10% higher
NB SR-55 between the NB on-ramp from Edinger Ave and the NB off-ramp to McFadden Ave	About 3% higher	About 13% higher
NB SR-55 between the NB on-ramp from McFadden Ave and the NB off-ramp to I-5	About 209% higher	About 248% higher
NB SR-55 off-ramp to Edinger Ave	About 5% higher	About 12% higher
NB SR-55 on-ramp from McFadden Ave	About 102% higher	About 93% higher
NB SR-55 off-ramp to SB I-5	About 22% higher	--
Southbound SR-55		
SB SR-55 on-ramp from SB I-5	About 29% higher	About 7% higher
SB SR-55 between the on-ramp from I-5 and the SB off-ramp to McFadden Ave	About 167% higher	About 159% higher
SB SR-55 between the SB off-ramp to McFadden Ave and the SB on-ramp from McFadden Ave	About 29% higher	--
SB SR-55 between the SB off-ramp to Edinger Ave and the SB on-ramp from Edinger Ave	About 6% higher	--
SB SR-55 off-ramp to EB Dyer Rd	--	About 6% higher
SB SR-55 between the SB off-ramp to Dyer Rd and the on-ramp from Dyer Rd	About 27% higher	About 11% higher
SB SR-55 on-ramp from westbound MacArthur Blvd	--	About 60% higher
SB SR-55 between the SB off-ramp to MacArthur Blvd and the SB on-ramp from WB MacArthur Blvd	About 48% higher	About 16% higher

Source: *Final Traffic Operations Report* (2015).

Ave = Avenue

Blvd = Boulevard

EB = eastbound

I-5 = Interstate 5

I-405 = Interstate 405

NB = northbound

SB = southbound

SR-55 = State Route 55

Rd = Road

WB = westbound

It was determined from a review of the accident data that rear-end collisions were the most common accident type, accounting for approximately 60 percent of all accidents. Other key accident types included sideswipes and hit-objects. Rear-end collisions are typically related to traffic congestion in chokepoint areas and are associated with sudden attempts to stop when traffic volumes exceed the capacity of the road. The majority of sideswipe accidents can usually be attributed to lane weaving and narrow lane widths.

Improvements in the SR-55 corridor would improve safety by relieving traffic congestion, which in turn would reduce rear-end accidents in the area. The improvements would allow vehicles to merge easier throughout the corridor, thereby reducing sideswipe occurrences by giving drivers more time and space to merge with

adjacent traffic. Increasing the lane widths would also improve the safety of the corridor by giving the drivers more space in which to operate their vehicle.

1.2.2.2 Operational Deficiencies

The traffic congestion, delays, and reduced travel speeds currently experienced on the project segment of SR-55 are partly the result of the following nonstandard features that are not consistent with the Caltrans *Highway Design Manual*:

- Nonstandard deceleration lengths at various off-ramps
- Nonstandard shoulder widths at various locations along SR-55
- Nonstandard horizontal clearance at various locations along SR-55
- Nonstandard successive on-ramps at various locations, such as the southbound MacArthur Boulevard on-ramps, the northbound MacArthur Boulevard on-ramps, and the northbound Dyer Road on-ramps
- Nonstandard vertical clearance at the South Tustin overhead bridge
- Nonstandard median width throughout the project limits
- Nonstandard interchange spacing
- Nonstandard weaving length
- Nonstandard curve radii at various ramps
- Nonstandard auxiliary lane lengths at various locations
- Nonstandard lane widths at various locations
- Nonstandard vertical curve sight distances at various locations
- Nonstandard horizontal curve sight distances at various locations

Many of the deficiencies would be corrected by designing and constructing the project improvements at these locations to the standards in the Caltrans *Highway Design Manual*. Mandatory and advisory design exceptions are proposed for some of these deficiencies, as described later in this chapter.

1.2.2.3 Social and Economic Demands

A review of SCAG regionally adopted growth projections indicates that continuing growth is forecasted in the subregion served by SR-55 (SCAG 2008). The population of Orange County is expected to increase from 3 million persons in 2008 to over 3.4 million persons in 2035, an increase of more than 14 percent. Growth in Riverside County is projected to increase at a faster pace, with the population in that County projected to increase from 2.1 million in 2008 to 3.3 million in 2035, an increase of 56 percent. This regional growth will continue to place a high demand on SR-55 by

Orange and Riverside County residents traveling to jobs, retail, and other designations in central and coastal Orange County.

1.2.2.4 Legislation

Measure M

The SR-55 Improvement Project Between I-405 and I-5 is part of a larger suite of transportation improvements included in Orange County's 30-year Measure M2 (M2) Plan. M2, the one-half cent transportation sales tax, is planned to provide more than \$15 billion in transportation improvements in Orange County through 2041 (2011 to 2041). M2 is comprised of the following transportation improvement programs: freeways, local streets and roads, and transit. Up to 43 percent of the funds are intended to fulfill transit and system preservation needs. Another 4 percent are reserved for two unique environmental programs.

The M2 program was publicly reviewed through a Program Environmental Impact Report prior to voters approving the ballot measure in November 2006. Since 2008, the M2 program has been included in the SCAG RTP, SCS, and the associated Program Environmental Impact Reports prepared by SCAG.

OCTA Freeway Chokepoint Program

The OCTA Freeway Chokepoint Program was initiated in 2001 to support cooperative efforts with Caltrans to identify chronic freeway bottlenecks and to develop projects to remedy those identified deficiencies. As part of that Program, freeway improvements were identified to alleviate localized freeway chokepoints. Funds for those projects were allocated from Measure M2 and other sources. The SR-55 Widening Project is included in the OCTA Freeway Chokepoint Program.

1.2.2.5 Modal Interrelationships and System Linkages

SR-55 is an integral component of the transportation system in Orange County. It provides a key linkage between the coastal areas in Newport Beach and other beach communities and cities along the corridor in central Orange County. SR-55 has interchanges with a number of other freeways, providing access to the countywide and regional freeway systems. The four Build Alternatives would enhance mobility in the SR-55 corridor, thereby improving mobility in this part of Orange County.

The Los Angeles to San Diego (LOSSAN) rail corridor, which is an important passenger and freight rail corridor that connects metropolitan areas from Los Angeles to San Diego, crosses SR-55 on an overhead rail crossing approximately 500 feet (ft) north of Edinger Avenue in the City of Santa Ana. Train operations on this segment

of the LOSSAN rail corridor include Amtrak's Pacific Surfliner intercity passenger rail service, the Southern California Regional Rail Authority (SCRRA) Metrolink commuter rail service, and the Union Pacific Railroad (UPRR) and BNSF Railway freight rail services.

SR-55 does not directly serve the Ports of Los Angeles and Long Beach or the rail transfer yards and is not a major corridor for goods movement in Southern California. However, SR-55 provides a connection to the Ports of Los Angeles and Long Beach via I-405, SR-22, and SR-91.

JWA is immediately east of SR-55 and south of I-405. There is direct access to JWA from SR-55 via ramps from SR-55 southbound or northbound to southbound I-405. The four Build Alternatives would not modify or otherwise affect the existing access to/from SR-55 to/from JWA via I-405.

Nine OCTA bus routes operate on SR-55 and arterials in the vicinity of SR-55: Routes 53 and 86 on Main Street; Route 59 on Dyer Road; Route 66 on McFadden Avenue; Route 70 on Edinger Avenue; Route 72 on Warner Avenue; Route 76 on MacArthur Boulevard; Route 66 on Newport Avenue; Route 71 on Red Hill Avenue; Routes 59 and 72 on Pullman Street; Routes 464 and 794, which use SR-55; and Route 213, which uses Dyer Road and SR-55 within the project limits. The HOV lanes on SR-55 are used by private transit companies, taxis, carpools, and vanpools. All the transit and shared ride modes would continue to use SR-55 during the project construction and in the long term. OCTA will also continue to identify opportunities to improve transit services in the SR-55 corridor as part of its transit planning activities throughout Orange County. The capacity and operational improvements provided by the four Build Alternatives would support these transit and shared ride modes in the future.

1.2.2.6 Air Quality Improvements

All four Build Alternatives include modifications to the existing HOV lanes or the construction of new HOV lanes. Alternatives 3 and 4 include restoring existing auxiliary lanes and the addition of new auxiliary lanes. All the existing on-ramps on the project segment of SR-55 are currently metered; those ramps would continue to be metered under all four Build Alternatives. These project features would contribute to air quality emissions reductions in the long term. The Build Alternatives will continue to directly benefit transit vehicles (and their passengers) traveling in HOV

lanes. Carpool, vanpool, and bus services in the SR-55 corridor would benefit from the time savings as a result of using the existing and proposed HOV lanes.

1.2.2.7 Independent Utility and Logical Termini

The project limits for the SR-55 Widening Project were defined based on providing a logical and independent set of improvements. Logical termini are defined as rational end points for transportation improvement and analysis of the potential environmental impacts of a proposed project. A project is defined as having independent utility if it meets the project purpose in the absence of other improvements in the project segment or in other parts of the corridor.

Logical Termini

The four Build Alternatives provide logical termini for the proposed improvements to SR-55 because they provide for direct connections to other major transportation facilities (I-5 and I-405), which themselves are destinations of major traffic volumes. The improvements in the four Build Alternatives terminate at major freeway-to-freeway interchanges (I-5 on the north and I-405 on the south).

The southern project terminus of the four Build Alternatives just north of the SR-55/I-405 Interchange experiences a substantial change in traffic demand on SR-55, with higher volumes north of and lower volumes south of the SR-55/I-405 Interchange. The SR-55/I-5 Interchange, at the north end of the project segment, experiences substantial traffic transitioning to/from I-5 and to/from SR-55, with higher volumes south of and lower volumes north of the SR-55/I-5 Interchange.

Independent Utility

The proposed project would have independent utility. The general-purpose, HOV, and auxiliary lanes included in the Build Alternatives would provide benefits to the traveling public without requiring or being dependent on the provision of other improvements on SR-55 or other freeways or arterials. Those improvements would benefit travelers as they enter/exit the freeway or travel in the general-purpose and HOV lanes. The Build Alternatives represent a reasonable expenditure even if no additional transportation improvements are made in the corridor, they can be implemented in the absence of any other improvements, and they do not restrict consideration of alternatives for other reasonably foreseeable transportation improvements in the SR-55 corridor and other corridors in the Project Area. Because the Build Alternatives meet the project purpose in the absence of other improvements in the SR-55 corridor, the SR-55 widening project would have independent utility.

1.3 Project Description

This section describes the proposed action and project alternatives that were developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives are “Alternative 1” (additional auxiliary lanes), “Alternative 2” (one new general-purpose lane), “Alternative 3” (one new general-purpose lane and additional auxiliary lanes), “Alternative 4” (one new HOV lane and auxiliary lanes), and the “No Build Alternative.”

The project is located in Orange County on SR-55 between just north of the I-405/SR-55 Interchange and the I-5/SR-55 Interchange (between Post Miles 6.4 and 10.3). The total length of the project is approximately 4 miles (mi). Within the limits of the proposed project, SR-55 currently has four general-purpose lanes and an HOV lane in each direction, with auxiliary lanes between ramps at various locations. The purpose of the proposed project is to provide congestion relief, improve traffic flow, and increase mobility on SR-55.

1.3.1 Project Alternatives

The criteria that will be used to evaluate the project alternatives are the design features (standard and nonstandard), improvements in LOS, and environmental impacts. The potential environmental impacts of the project are assessed in this environmental document (ED) for the following parameters: land use, growth, community impacts, utilities and emergency services, traffic and transportation, visual, cultural resources, hydrology and floodplains, water quality, geology and soils, paleontological resources, hazardous waste and materials, air quality, noise, biological resources (i.e., natural communities, wetlands and other waters, and plant, animal, invasive, and threatened and endangered species), cumulative impacts, and climate change.

Existing commercial and industrial development adjacent to the project segment of SR-55 severely limits the availability of right of way and limits the range of alternatives for improving the freeway. The four Build Alternatives evaluated in this ED are described generally in this section, followed by a detailed discussion of permanent and temporary features common to all the Build Alternatives and the features unique to each alternative.

Alternative 1: Additional Auxiliary Lanes and Southbound General-Purpose Lane

Alternative 1 proposes new auxiliary lanes in the northbound direction on SR-55 by widening to the outside at two locations:

- Between the MacArthur Boulevard and Dyer Road Interchanges
- Between the Dyer Road and Edinger Avenue Interchanges

In the southbound direction on SR-55, a general-purpose lane would be constructed between the southbound I-5 connector and the east Dyer Road off-ramp. The southbound auxiliary lane between the McFadden Avenue and Edinger Avenue interchanges will be restored to match the existing condition. Additionally, the transition length for merging between the existing southbound HOV lane on SR-55 and the southbound I-5/SR-55 Connector HOV lane would be extended past Edinger Avenue.

Alternative 2: New General-Purpose Lanes

Alternative 2 proposes to construct one general-purpose lane in both the northbound and southbound directions on SR-55 by widening to the outside.

In the northbound direction, auxiliary lanes between the northbound I-405 connector and the MacArthur Boulevard Interchange, and between the Edinger Avenue and McFadden Avenue Interchanges will be restored to match the existing condition. In the southbound direction, the auxiliary lane between the McFadden Avenue and Edinger Avenue interchanges will be restored to match the existing condition. Additionally, the transition length for merging between the existing southbound HOV lane on SR-55 and the southbound I-5/SR-55 Connector HOV lane would be extended past Edinger Avenue.

Alternative 3: New General-Purpose Lanes and Additional Auxiliary Lanes

Alternative 3 proposes to add one general-purpose lane in the northbound and southbound directions, add additional northbound auxiliary lanes, and restore existing auxiliary lanes. In the northbound direction, new auxiliary lanes would be constructed at two locations:

- Between the MacArthur Boulevard and Dyer Road interchanges
- Between the Dyer Road and Edinger Avenue interchanges

The restored auxiliary lane between the Edinger Avenue and McFadden Avenue interchanges would be extended to the northbound I-5 connector and the northbound McFadden on-ramp would be restricted to the northbound I-5 connector only. As a result, access from the McFadden on-ramp to northbound SR-55 and southbound I-5 would be eliminated.

In the southbound direction, the transition length for merging between the existing southbound SR-55 HOV lane and the southbound I-5/SR-55 HOV connector would be extended past Edinger Avenue.

Alternative 4: New HOV Lanes and Additional Auxiliary Lanes

Alternative 4 proposes to add a second HOV lane in each direction between the I-405 and I-5 HOV direct connectors.

Additionally, in the northbound direction, auxiliary lanes will be constructed at three locations:

- Between the MacArthur Boulevard and Dyer Road interchanges
- Between the Dyer Road and Edinger Avenue interchanges
- From just south of the Tustin Overhead to the northbound I-5 connector

The northbound McFadden on-ramp would be restricted to the northbound I-5 connector only. As a result, access from the McFadden on-ramp to northbound SR-55 and southbound I-5 would be eliminated.

In the southbound direction, a general-purpose lane would be created between the southbound I-5 connector and the east Dyer Road off-ramp. The existing auxiliary lane between the McFadden Avenue and Edinger Avenue interchanges would be restored to match the existing condition.

Design features common to all four Build Alternatives are discussed below in Section 1.3.2, Common Design Features of the Build Alternatives. Design features unique to each Build Alternative are discussed in Section 1.3.3, Unique Features of the Build Alternatives. The existing condition on SR-55 was shown earlier on Figure 1-2. The project features in Alternatives 1, 2, 3, and 4 are shown on Figures 1-4, 1-5, 1-6, and 1-7, respectively.

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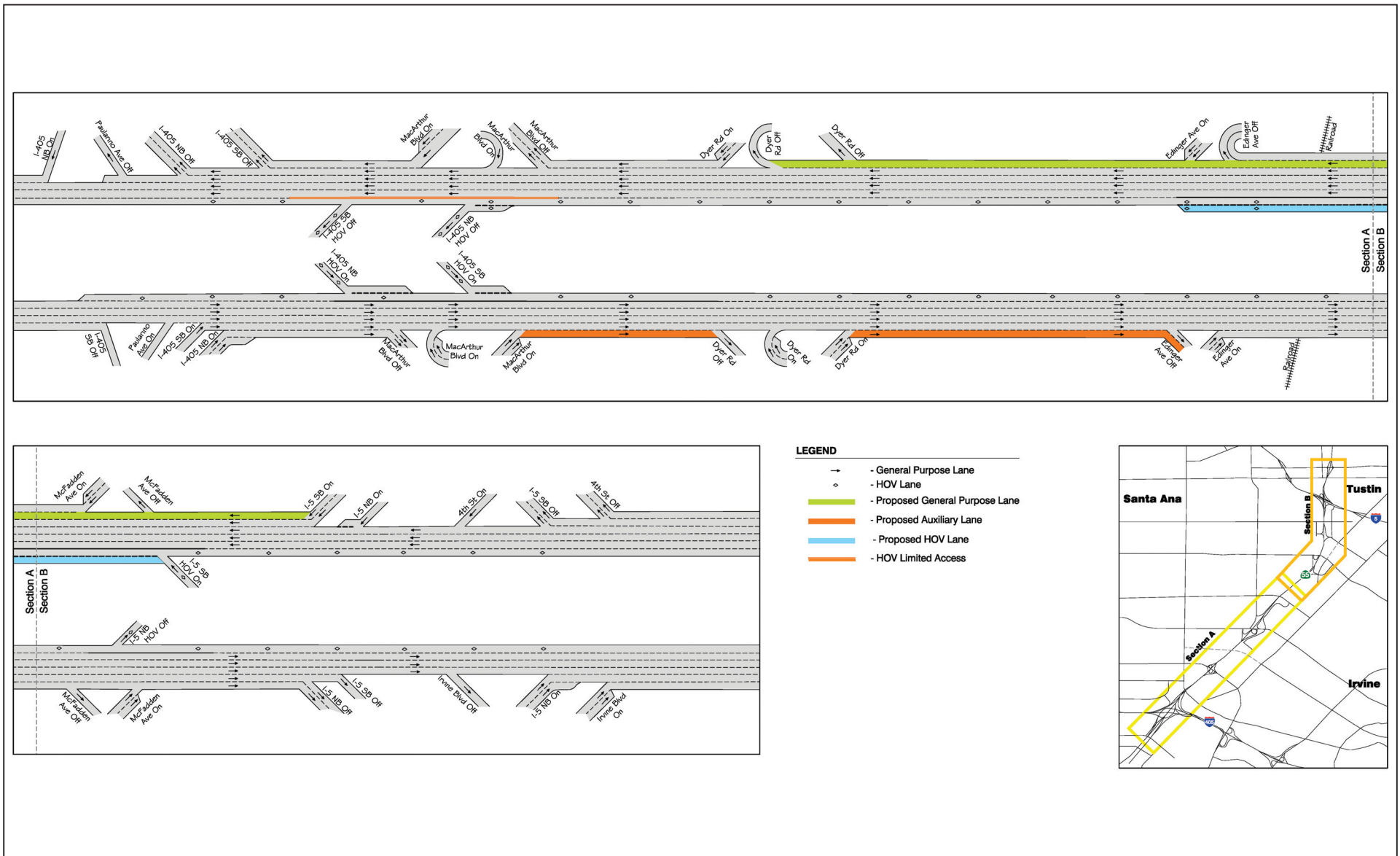


FIGURE 1-4



NOT TO SCALE

SOURCE: Final Traffic Operations Report (2014)

I:\HDR\1102\GIS_EA\Build Alternative 1.cdr (11/13/2015)

State Route 55 (SR-55) Improvement Project between
Interstate 405 (I-405) and Interstate 5 (I-5)

Build Alternative 1

12-ORA-55 PM 6.4/10.3

EA No. 0J3400/EFIS 1200020328

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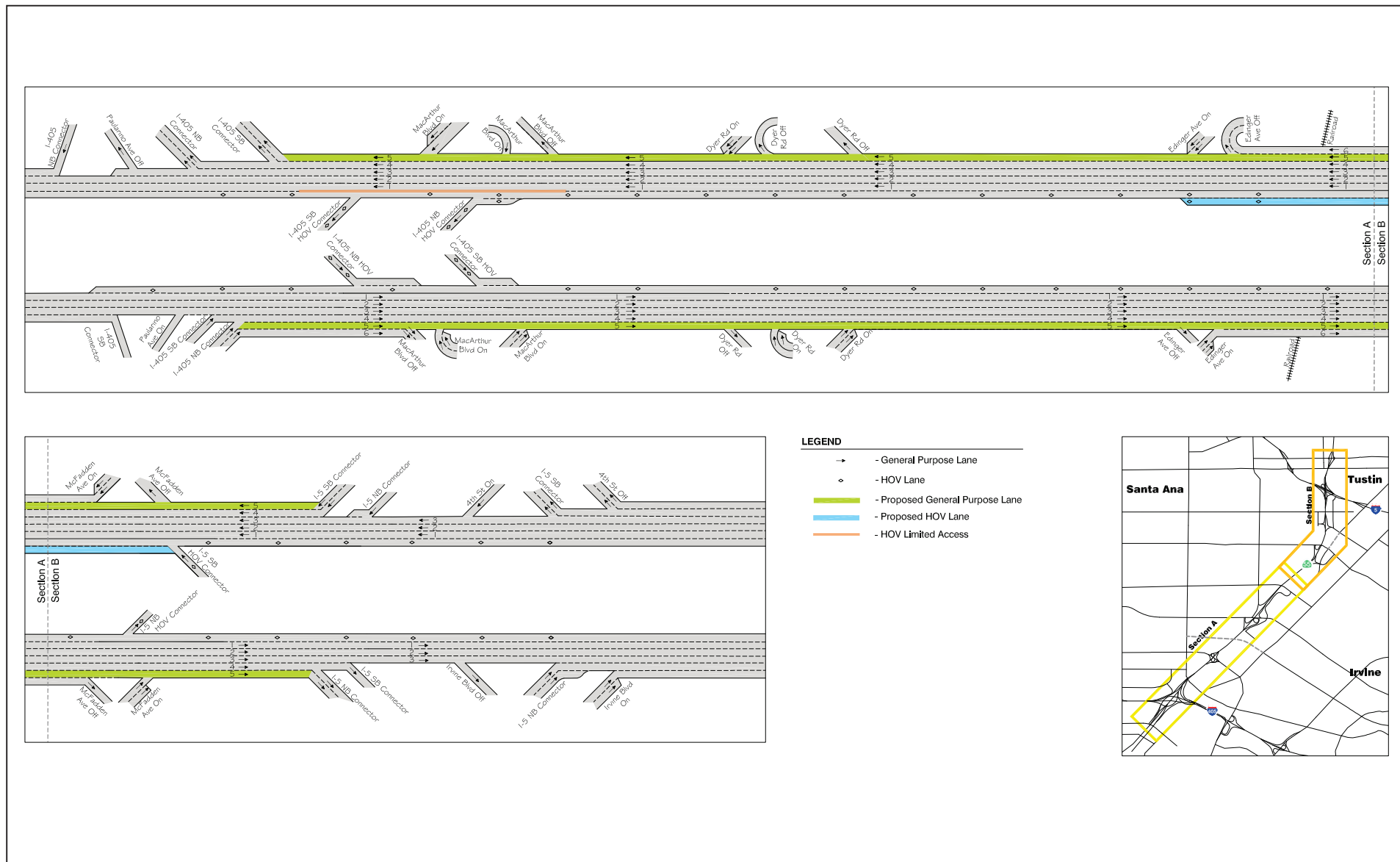


FIGURE 1-5



NOT TO SCALE

SOURCE: Fehr & Peers

I:\HDR1102\GIS_EA\Build Alternative 2.cdr (11/13/2015)

State Route 55 (SR-55) Improvement Project between
Interstate 405 (I-405) and Interstate 5 (I-5)

Build Alternative 2

12-ORA-55 PM 6.4/10.3

EA No. 0J3400/EFIS 1200020328

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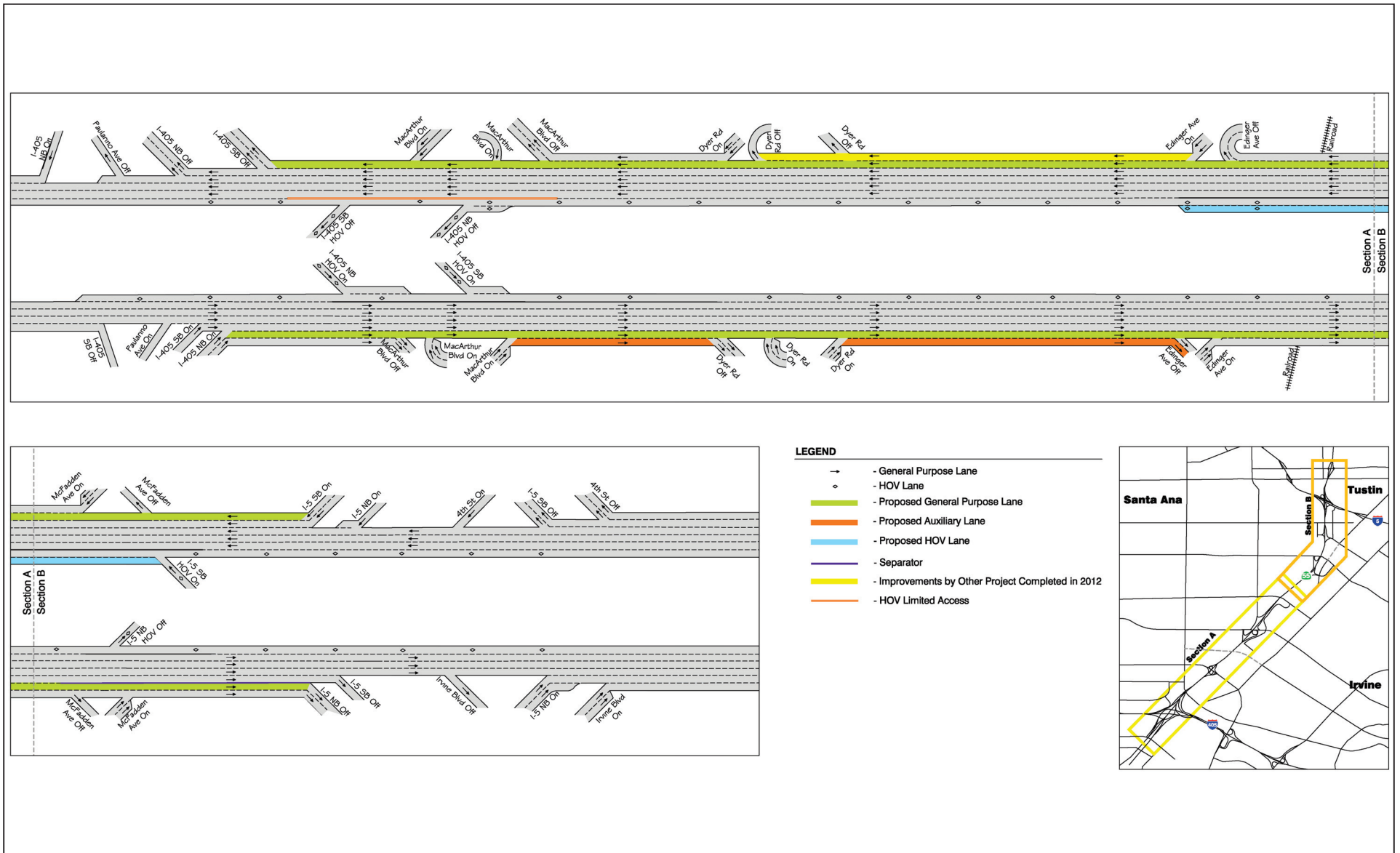


FIGURE 1-6



NOT TO SCALE

SOURCE: Final Traffic Operations Report (2014)

I:\HDR1102\GIS_EA\Build Alternative 3.cdr (11/13/2015)

State Route 55 (SR-55) Improvement Project between
Interstate 405 (I-405) and Interstate 5 (I-5)

Build Alternative 3

12-ORA-55 PM 6.4/10.3

EA No. 0J3400/EFIS 1200020328

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1.3.2 Common Design Features of the Build Alternatives

1.3.2.1 Permanent Project Components

Mainline Improvements

As shown on the figures of the alternatives, the Build Alternatives would all add one general-purpose lane southbound between McFadden Avenue and Edinger Avenue. In addition, the Build Alternatives would extend the transition length for merging between the existing southbound HOV lane and the southbound I-5/SR-55 HOV connector to past Edinger Avenue.

Each Build Alternative would widen westbound Dyer Road to include an exclusive right-turn lane from the northbound SR-55 on-ramp to a relocated driveway at the motel adjacent to this ramp.

Ramp Improvements

All four Build Alternatives would require modifications to the following ramps to accommodate the mainline improvements:

- Westbound MacArthur Boulevard to the northbound SR-55 on-ramp
- Southbound SR-55 off-ramp to MacArthur Boulevard
- Northbound SR-55 off-ramp to Dyer Road
- Northbound SR-55 off-ramp to MacArthur Boulevard
- Eastbound Dyer Road to the northbound SR-55 loop on-ramp
- Westbound Dyer Road to the northbound SR-55 on-ramp
- Eastbound Dyer Road to the southbound SR-55 on-ramp
- Northbound SR-55 off-ramp to Edinger Avenue
- Southbound SR-55 loop off-ramp to Edinger Avenue
- Edinger Avenue to the southbound SR-55 on-ramp
- McFadden Avenue to the southbound SR-55 on-ramp
- Southbound SR-55 off-ramp to McFadden Avenue

Bridges

All four Build Alternatives would require northbound widening of the Dyer Road undercrossing, southbound widening of the Edinger Avenue undercrossing, and southbound widening of the South Tustin Overhead bridge structures.

Retaining Walls

To minimize the need to acquire right of way by keeping the permanent improvements within the existing right of way, all four Build Alternatives would require construction of retaining walls at the following locations:

- Northbound SR-55 just north of the Dyer Road undercrossing
- Tieback wall on the northbound SR-55 side of the Warner Avenue overcrossing
- Two locations on southbound SR-55 between the McFadden Avenue on-ramp and the Edinger Avenue off-ramp

Drainage Facilities

There are extensive storm drain facilities throughout the SR-55 corridor. The project construction would affect some of those facilities in order to contain storm water flows within the project limits or to accommodate project improvements such as sound and retaining walls. The changes to drainage facilities as a result of the four Build Alternatives include relocation, extension, and/or adjustment of the existing drainage systems; additional inlet, down drains, and/or overside drains; and abandonment and/or removal of system components that are no longer serviceable.

All four Build Alternatives would require the relocation of the existing Caltrans culverts and concrete pipe storm drains in the SR-55 right of way described in Table 1.8. In addition, all Build Alternatives would reconfigure Lane Channel (a 31.5 ft wide concrete trapezoidal channel adjacent to the west side of SR-55 between the MacArthur Boulevard and Dyer Road interchanges) from a trapezoidal channel to a rectangular channel and would realign the channel. The Lane Channel is an Orange County Flood Control District facility.

Table 1.8 Proposed Drainage Relocations for the Four Build Alternatives

Size and Type of Facility	Location	Proposed Relocation
30" alternative pipe culvert	Parallel to NB SR-55 from south of Warner Ave to Valencia Ave	Would be relocated farther east to accommodate the freeway widening
54" alternative pipe culvert 48" alternative pipe culvert 42" reinforced concrete pipe 36" alternative pipe culvert	Parallel to SB SR-55 from north of Edinger Ave to north of McFadden Ave	Would be relocated farther west to accommodate the freeway widening and would join an existing 24" alternative pipe culvert
Open channel (concrete V-ditch)	Northbound SR-55 between Dyer Road off-ramp and loop on-ramp	Convert the open channel to an underground 24 pipe

Source: *Draft Preliminary Drainage Report* (2013).

Ave = Avenue

SB = southbound

NB = northbound

SR-55 = State Route 55

Utilities

During construction, all utilities within the freeway right of way would be protected in place or relocated. During final design, the Project Engineer would coordinate with each utility provider to finalize the exact location of that utility's facilities, assess whether the facilities can be protected in place during construction or would require relocation, and review the project plans for protection in place/relocation of the facility with the utility provider prior to construction. The utility relocations and/or protection in place common to all four Build Alternatives are listed in Table 1.9. All four Build Alternatives would require permanent utility easements on eight parcels.

Table 1.9 Utility Relocations and Protection in Place Common to the Four Build Alternatives

Utility Provider	Description of Facility	Project Effect (Relocation or Protection in Place)
City of Santa Ana	12" water line in 20" casing	SR-55 crossing would be relocated (jack and bore)
	24" water line in 30" casing	SR-55 crossing would be relocated (jack and bore)
	Pressure reducing facility	Would be reconstructed west of SR-55
Orange County Sanitation District	Sewer manhole	Would be removed from NB SR-55
	24" VCP sewer	Casing for sewer line crossing would be extended east of SR-55
	15" VCP sewer	Would be relocated along west side of SB SR-55
Southern California Edison	Overhead 66 kV electric transmission line	Would be relocated to an underground line along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd
		Would be relocated along the north and south sides of MacArthur Blvd on the east side of SR-55
		Would be relocated with 4 steel poles and 2 wood poles along Pullman St on the east side of SR-55 between MacArthur Blvd and McGaw Ave
		Would be relocated to an underground line along Pullman St on the east side of SR-55 between Garry Ave and Carnegie Ave
	Overhead 66 kV electric transmission lines	Would be relocated to an underground line along Pullman St on the east side of SR-55 and Warner Ave
	Overhead electric distribution line	Would be relocated to an underground line at the corner of Pullman St and Carnegie Ave
	Overhead 66 kV electric transmission line	Would be relocated along Ritchey St on the west side of SR-55 and then cross SR-55 and continue along the east side of NB SR-55
Southern California Gas Company	Underground electric line	Would be relocated along the west side of SB SR-55
	Overhead electric line	Would be relocated with 2 wood poles along the west side of SB SR-55
	30" high-pressure gas main	Casing for gas line crossing would be extended east of SR-55
MWD	4" gas line	Would be relocated along Pullman St on the east side of SR-55 between Dyer Rd and Warner Ave
	30" high-pressure gas main	Would be relocated along the west side of SB SR-55
MWD	18" water line	Would be relocated (jack and bore casing)
AT&T	4" cable line	Casing for cable line crossing would be extended east and west of SR-55

Source: *Draft Project Report* (2015).

Ave = Avenue

Blvd = Boulevard

kV = kilovolt

MWD = Metropolitan

Water District

NB = northbound

Rd = Road

SB = southbound

SR-55 = State Route 55

St = Street

VCP = vitrified clay pipe

Sound Walls

Two noise barriers were determined to be reasonable. Noise Barrier (NB) No. 3 and combined NB No. 3 Reduced and NB No. 4 would be reasonable and feasible. NB No. 3 is 1,021 ft long, 16–22 ft in height, and proposed to be located along the Caltrans right of way/property line on the northbound side of SR-55 near the northbound McFadden Avenue off-ramp at Sycamore Avenue. Combined NB No. 3 Reduced and NB No. 4 is 1,244 ft long, 10–22 ft in height, and proposed to be located along the perimeter of the multi-family residences located along Kenyon Drive in Tustin. The location of these barriers are shown later on Figure 2.14-2.

Water Quality Best Management Practices (BMPs)

The existing impervious surface area within the project limits is 122.9 ac. The new impervious areas and the total impervious areas under each of the Build Alternatives are listed in Table 1.10. Treatment BMPs being proposed as part of the Build Alternatives include a series of biofiltration strips and swales and, potentially, an infiltration basin.

Table 1.10 Impervious Surface Areas by Alternative

Alternative	New Impervious Surface Area (ac)	Total Impervious Surface Area (ac)
Alternative 1	7.25	130.15
Alternative 2	11.32	134.22
Alternative 3	15.28	138.18
Alternative 4	15.02	137.92

Source: *Water Quality Assessment Report* (2014).

ac = acres

Ramp Metering Systems and Other Facilities

There are a number of existing Caltrans facilities and systems within the freeway right of way that may need to be modified and/or relocated to accommodate the improvements provided in the Build Alternatives. These include the ramp metering system at every on-ramp on the project segment of SR-55, changeable message signs, closed-caption television, loop detectors, Transportation Systems Management (TSM), and fiber optic communication systems. The modified and/or relocated facilities and systems would all be located within the right of way for SR-55.

Existing overhead freeway signs at the ramps would be relocated to accommodate the modified ramps. Call boxes along the freeway mainline and metal beam guard rails would be relocated within the SR-55 right of way, as needed, to accommodate the widened freeway and modified ramps.

An Exception to Ramp Metering Policy (HOV Bypass Lane at Ramp Meters) Fact Sheet will be required for locations where ramp traffic demand requires two-lane ramps and providing an HOV Bypass Lane is not feasible. Fact Sheets will be prepared once the Preferred Alternative is selected.

Landscape and Irrigation Systems

Planting plans included in the final design for the proposed project would consist of replacement planting for existing trees, shrubs, and ground cover removed by the Build Alternatives where space within the freeway right of way is available for landscaping purposes. The replacement planting would be consistent with the existing landscape palette along the project segment of SR-55 and would incorporate native plant species to the extent feasible.

Existing irrigation systems temporarily removed during construction would be replaced. Project-related irrigation system modifications would include extending existing irrigation crossovers under roads, installing new waterline crossovers inside bridge cells as needed, and modifying existing systems to maintain water supply to undisturbed planting areas.

Right of Way Acquisition

All four Build Alternatives would require the full acquisition of one parcel adjacent to the southbound SR-55 on-ramp from Dyer Road and three parcels adjacent to the north side of the southbound SR-55 off-ramp to Grand Avenue, and the partial acquisition of seven parcels. The locations of the anticipated full and partial parcel acquisitions under all four Build Alternatives are shown later on Figures 2.3-2 through 2.3-5.

Design Exceptions (Advisory and Mandatory)

All four Build Alternatives would require design exceptions. Design exceptions are necessary when the proposed design deviates from the standard design features presented in the Caltrans *Highway Design Manual*. For example, the design standard for a freeway left-side shoulder is 10 ft; design exceptions would be requested for locations where the columns supporting overcrossing bridges encroach into the shoulder and narrow the shoulder to approximately 7 ft beneath the bridge. None of the proposed Build Alternatives would be full standard; mandatory and advisory design exceptions would be required for all Build Alternatives. A full standard alternative would not be cost effective, would require extensive rebuild of the existing freeway, and would have extensive right of way impacts. There are 8 mandatory and

12 advisory design standards common to all alternatives that would require design exceptions at one or more locations along the project.

An Exception to Ramp Metering Policy (HOV Bypass Lane at Ramp Meters) Fact Sheet will be required for locations where ramp traffic demand requires two-lane ramps and providing an HOV Bypass Lane is not feasible. Fact Sheets will be prepared once the Preferred Alternative is selected.

1.3.3 Unique Features of the Build Alternatives

This section describes features unique to each Build Alternative. If there are no features unique to an alternative beyond those listed in Section 1.3.2, those features are not discussed in detail in this section.

1.3.3.1 Alternative 1: Additional Auxiliary Lanes

The features provided in Alternative 1 were shown earlier on Figure 1-4. The features unique to Alternative 1 are described below.

The maximum disturbance limits, shown on Figure 1-1, define the maximum area that could potentially be disturbed during construction of Alternative 1. The actual construction disturbance area may be less than the maximum disturbance limits shown on Figure 1-1 but would not extend outside the area within those defined maximum disturbance limits. The maximum disturbance limits include areas anticipated to be used during construction for temporary construction easements (TCEs) and all right of way anticipated to be acquired to accommodate the permanent improvements in Alternative 1.

Right of Way Acquisition

Alternative 1 would not require any partial acquisitions beyond those described in Section 1.3.2. The locations of the anticipated full and partial parcel acquisitions under Alternative 1 are shown later on Figure 2.3-2.

Design Exceptions (Advisory and Mandatory)

In addition to the design exceptions common to all the Build Alternatives, Alternative 1 would require 1 mandatory and 1 advisory design standards that would require design exceptions at one or more locations along the alignment of this alternative.

Temporary Construction Easements

Alternative 1 would require a total of 24 TCEs; 16 would be on commercial and industrial parcels, 5 TCEs would be on residential parcels, 2 TCEs would be on flood control parcels, and 1 TCE would be on a railroad parcel.

1.3.3.2 Alternative 2: One New General-Purpose Lane

The features provided in Alternative 2 were shown earlier on Figure 1-5. The features unique to Alternative 2 are described below.

Figure 1-1 shows the maximum disturbance limits for Alternative 2. The actual construction disturbance area may be less than the maximum disturbance limits shown on Figure 1-1 but would not extend outside the area within those defined maximum disturbance limits. The maximum disturbance limits include areas anticipated to be used during construction for TCEs and all right of way anticipated to be acquired to accommodate the permanent improvements in Alternative 2.

Ramp Improvements

In addition to the ramp improvements described in Section 1.3.2, Alternative 2 would require modification of all the other ramps along the project segment of SR-55, with the exception of the southbound SR-55 off-ramp to Dyer Road/Grand Avenue. The additional ramps that would need modification under Alternative 2 are:

- Eastbound MacArthur Boulevard to the northbound SR-55 loop on-ramp
- Westbound MacArthur Boulevard to the southbound SR-55 loop on-ramp
- Eastbound MacArthur Boulevard to the southbound SR-55 on-ramp
- Southbound SR-55 loop off-ramp to Dyer Road
- Edinger Avenue (from Newport Avenue) to the northbound SR-55 on-ramp
- Northbound SR-55 off-ramp to McFadden Avenue
- Westbound McFadden Avenue to the northbound SR-55 on-ramp

Bridges

In addition to the bridge widenings discussed above under Section 1.3.2, freeway widening to accommodate the additional general-purpose lanes for Alternative 2 would require northbound and southbound widening at the MacArthur Boulevard undercrossing bridge structure, southbound widening of the Dyer Road undercrossing, and northbound widening of the South Tustin overhead.

Retaining Walls

In addition to the retaining walls described in Section 1.3.2, Alternative 2 would require the construction of retaining walls at the following locations:

- On northbound SR-55 between I-405 and MacArthur Boulevard
- On northbound SR-55, just north of the MacArthur Boulevard undercrossing
- On the westbound Dyer Road on-ramp to northbound SR-55
- On northbound SR-55, just south of the Edinger Avenue undercrossing
- Two locations on northbound SR-55 between Edinger Avenue and McFadden Avenue
- On southbound SR-55, just north of the Dyer Road undercrossing
- Tieback wall on the southbound side of the Warner Avenue overcrossing

Drainage Facilities

In addition to the storm drain relocations described in Table 1.8, Alternative 2 would require the relocation of the storm drain facilities described in Table 1.11.

Table 1.11 Alternative 2 Proposed Drainage Relocations

Size and Type of Facility	Location	Proposed Relocations
53" reinforced concrete pipe 64" x 40" reinforced concrete pipe arch 30" reinforced concrete pipe 24" reinforced concrete pipe	Parallel to NB SR-55, north of Main St and south of MacArthur Blvd	Would be relocated farther east to accommodate the widening
24" alternative pipe culvert	Parallel to NB SR-55, north of Main St and south of MacArthur Blvd	Would be relocated farther east to accommodate the widening
66" alternative pipe culvert 8 ft x 4 ft reinforced concrete box 63" alternative pipe culvert 60" alternative pipe culvert 54" alternative pipe culvert	Parallel to SB SR-55 from north of Dyer Rd to south of Edinger Ave	Would be relocated farther west to accommodate the widening and would join an existing 54" alternative pipe culvert
8 ft x 4 ft reinforced concrete box	Parallel to NB SR-55 from south of McFadden Ave to north of McFadden Ave	Would be relocated farther east to accommodate the widening and join an existing 8 ft x 4 ft reinforced concrete box

Source: *Draft Preliminary Drainage Report* (2013).

Ave = Avenue
Blvd = Boulevard
ft = foot

NB = northbound
Rd = Road
SB = southbound

SR-55 = State Route 55
St = Street

Right of Way Acquisition

In addition to the right of way acquisitions described in Section 1.3.2, Alternative 2 would require the partial acquisition of 9 additional parcels. The locations of the

anticipated full and partial parcel acquisitions under Alternative 2 are shown later on Figure 2.3-3.

Design Exceptions (Advisory and Mandatory)

In addition to the design exceptions common to all the Build Alternatives, Alternative 2 would require 6 advisory design standards that would require design exceptions at one or more locations along the alignment of this alternative.

Utilities

In addition to the utility relocation and protection in place effects common to all the Build Alternatives, Alternative 2 would result in effects on additional utility facilities, as listed in Table 1.12. Alternative 2 would require permanent utility easements on one parcel in addition to the eight permanent utility easements common to all the Build Alternatives.

**Table 1.12 Utility Relocations and Protection in Place
Unique to Alternative 2**

Utility Provider	Description of Facility	Project Effect (Relocation or Protection in Place)
Irvine Ranch Water District	8" VCP sewer	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd, with a new manhole installed
	5 fire hydrants 6 water service lines 6 fire service lines 10 valve cans	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd
	Overhead 66 kV electric transmission line	Would be relocated
	Overhead electric steel pole	Would be relocated on the east side of SR-55
Southern California Edison	Overhead 66 kV electric transmission line	Would be relocated with one wood pole along Cowan St. on the east side of SR-55 between Main St and MacArthur Blvd
	Underground 12 kV electric distribution line	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd
	Pole anchor	Would be removed
	Wood pole	Would be replaced with steel pole
Southern California Gas Company	2" gas line	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd
AT&T	Underground Conduits	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd

Source: *Draft Project Report* (2015).

Bld = Boulevard

St = Street

kV = kilovolt

VCP = vitrified clay pipe

SR-55 = State Route 55

Temporary Construction Easements

Alternative 2 would require a total of 47 TCEs; 36 would be on commercial and industrial and industrial parcels, 5 TCEs would be on residential parcels, 3 TCEs would be on flood control parcels, 2 TCEs would be on railroad parcels, and 1 TCE would be on a publicly owned parcel.

1.3.3.3 Alternative 3: One New General-Purpose Lane and Additional Auxiliary Lanes

The features provided in Alternative 3 were shown earlier on Figure 1-6. The features unique to Alternative 3 are described below.

Figure 1-1 shows the maximum disturbance limits for Alternative 3. The actual construction disturbance area may be less than the maximum disturbance limits shown on Figure 1-1 but would not extend outside the area within those defined maximum disturbance limits. The maximum disturbance limits include areas anticipated to be used during construction for TCEs and all right of way anticipated to be acquired to accommodate the permanent improvements in Alternative 3.

Ramp Improvements

In addition to the ramp improvements described in Section 1.3.2, Alternative 3 would require modification of all the other ramps along the project segment of SR-55 to accommodate the improvements to the SR-55 mainline facilities. The additional ramps that would need modification under Alternative 3 are:

- Eastbound MacArthur Boulevard to the northbound SR-55 loop on-ramp
- Westbound MacArthur Boulevard to the southbound SR-55 loop on-ramp
- Eastbound MacArthur Boulevard to the southbound SR-55 on-ramp
- Southbound SR-55 loop off-ramp to Dyer Road
- Southbound SR-55 loop off-ramp to Dyer Road at Grand Avenue
- Northbound SR-55 off-ramp to McFadden Avenue
- McFadden Avenue to the northbound SR-55 on-ramp
- Edinger Avenue (from Newport Avenue) to the northbound SR-55 on-ramp

Bridges

In addition to the bridge widenings discussed above in Section 1.3.2, freeway widening to accommodate the additional general-purpose lanes for Alternative 3 would require northbound and southbound widening of the MacArthur Boulevard

undercrossing bridge structure, southbound widening of the Dyer Road undercrossing, and northbound widening of the South Tustin overhead.

Retaining Walls

In addition to the retaining walls described in Section 1.3.2, Alternative 3 would require the construction of retaining walls at the following locations:

- On northbound SR-55 between I-405 and MacArthur Boulevard
- On northbound SR-55, just north of the MacArthur Boulevard undercrossing
- On northbound SR-55, between the westbound MacArthur Boulevard on-ramp and the Dyer Road off-ramp
- On the westbound Dyer Road on-ramp to northbound SR-55
- On northbound SR-55, just south of the Edinger Avenue undercrossing
- Two locations on northbound SR-55, between Edinger Avenue and McFadden
- On southbound SR-55, just north of the Dyer Road undercrossing
- Tieback wall on southbound side of the Warner Avenue overcrossing

Drainage Facilities

In addition to the storm drain relocations described in Table 1.8, Alternative 3 would require relocation of the storm drain facilities described in Table 1.13.

Table 1.13 Alternative 3 Proposed Drainage Relocations

Size and Type of Facility	Location	Proposed Design
53" reinforced concrete pipe 64" x 40" reinforced concrete pipe arch 30" reinforced concrete pipe 24" reinforced concrete pipe	Parallel to NB SR-55, north of Main St and south of MacArthur Blvd	Would be relocated farther east to accommodate the widening
24" alternative pipe culvert	Parallel to NB SR-55, north of Main St and south of MacArthur Blvd	Would be relocated farther east to accommodate the widening
66" alternative pipe culvert 8 ft x 4 ft reinforced concrete box 63" alternative pipe culvert 60" alternative pipe culvert 54" alternative pipe culvert	Parallel to SB SR-55 from north of Dyer Rd to south of Edinger Ave	Would be relocated farther west to accommodate the widening and would join an existing 54" alternative pipe culvert
8 ft x 4 ft reinforced concrete box	Parallel to NB SR-55 from south of McFadden Ave to north of McFadden Ave	Would be relocated farther east to accommodate the widening and would join an existing 8 ft x 4 ft reinforced concrete box

Source: *Draft Preliminary Drainage Report* (2013).

Ave = Avenue

ft = foot

Rd = Road

SR-55 = State Route 55

Blvd = Boulevard

NB = northbound

SB = southbound

St = Street

Right of Way Acquisition

In addition to the right of way acquisitions described in Section 1.3.2, Alternative 3 would require the full acquisition of three parcels on southbound SR-55 just north of the Warner Avenue overcrossing and one parcel on northbound SR-55 just south of the Warner Avenue overcrossing. Alternative 3 would also require the partial acquisition of 23 parcels in addition to those acquisitions described in Section 1.3.2. The locations of the anticipated full and partial parcel acquisitions under Alternative 3 are shown later on Figure 2.3-4.

Design Exceptions (Advisory and Mandatory)

In addition to the design exceptions common to all the Build Alternatives, Alternative 3 would require 1 mandatory and 5 advisory design standards that would require design exceptions at one or more locations along the alignment of this alternative.

Utilities

In addition to the utility relocation and protection in place effects common to all the Build Alternatives described earlier in Table 1.9, Alternative 3 would result in effects on additional utility facilities as listed in Table 1.14. Alternative 3 would require permanent utility easements on 10 parcels in addition to the 8 permanent utility easements common to all the Build Alternatives.

Temporary Construction Easements

Alternative 3 would require a total of 59 TCEs; 48 TCEs would be on commercial and industrial parcels, 5 TCEs would be on residential parcels, 3 TCEs would be on flood control parcels, 2 TCEs would be on railroad parcels, and 1 TCE would be on a vacant parcel.

1.3.3.4 Alternative 4: One New HOV Lane and Auxiliary Lanes

The features provided in Alternative 4 were shown earlier on Figure 1-7. The features unique to Alternative 4 are described below.

Figure 1-1 shows the maximum disturbance limits for Alternative 4. The actual construction disturbance area may be less than the maximum disturbance limits shown on Figure 1-1 but would not extend outside the area within those defined maximum disturbance limits. The maximum disturbance limits include areas anticipated to be used during construction for TCEs and all right of way anticipated to be acquired to accommodate the permanent improvements in Alternative 4.

**Table 1.14 Utility Relocations and Protection in Place
Unique to Alternative 3**

Utility Provider and Facility	Description of Facility	Project Effect (Relocation or Protection in Place)
City of Santa Ana	3 fire hydrants 3 water service lines 3 fire service lines 5 valve cans 24" water line	Would be relocated along Pullman St between Dyer Rd and Warner Ave
		Would be relocated along Ritchey St on the west side of SR-55
Irvine Ranch Water District	8" VCP sewer	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd, with a new manhole installed
	5 fire hydrants 6 water service lines 6 fire service lines 10 valve cans	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd
Orange County Sanitation District	15" VCP sewer	Would be relocated along Ritchey St on the west side of SR-55
Southern California Edison	Overhead 66 kV electric transmission line	Would be relocated
	Overhead electric steel pole	Would be relocated on the east side of SR-55
	Overhead 66 kV electric transmission line	Would be relocated with one wood pole along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd
	Underground 12 kV electric distribution line	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd
	Pole anchor	Would be removed
	Wood pole	Would be replaced with steel pole
	Pole anchor	Would be removed
	Wood pole	Would be replaced with steel pole
Southern California Gas Company	2" gas line	Would be relocated along Cowan St on the east
	3" gas line	Would be relocated along Pullman St on the east side of SR-55 between McGaw Ave and Duryea Ave
Time Warner	Telecom cables	Would be relocated
AT&T	Underground conduits	Would be relocated along Cowan St on the east side of SR-55 between Main St and MacArthur Blvd
		Would be relocated along Pullman St on the east side of SR-55

Source: *Draft Project Report* (2015).

Ave = Avenue SR-55 = State Route 55
 Blvd = Boulevard St = Street
 kV = kilovolt VCP = vitrified clay pipe
 Rd = Road

Alternative 4 would also:

- Provide new auxiliary lanes on northbound SR-55 between the MacArthur Boulevard and Dyer Road interchanges, between the Dyer Road and Edinger Avenue interchanges, and from just south of the Tustin Overhead to the northbound I-5 connector;

- Restrict the northbound McFadden Avenue on-ramp on northbound SR-55 to the northbound I-5 connector only. As a result, access from the McFadden Avenue on-ramp to northbound SR-55 and southbound I-5 would be eliminated; and
- Create a general-purpose lane on southbound SR-55 between the southbound I-5 connector and the east Dyer Road off-ramp.

Ramp Improvements

In addition to the ramp improvements described in Section 1.3.2, Alternative 4 would require modification of the following ramps:

- Southbound SR-55 loop off-ramp to Dyer Road
- Southbound SR-55 off-ramp to Dyer Road at Grand Avenue
- Edinger Avenue (from Newport Ave) to the northbound SR-55 on-ramp
- Northbound SR-55 off-ramp to McFadden Avenue
- McFadden Avenue to the northbound SR-55 on-ramp
- MacArthur northbound loop on-ramp

Bridges

In addition to the bridge widenings discussed above under Section 1.3.2, freeway widening to accommodate the additional general-purpose lanes for Alternative 4 would require southbound widening of the Dyer Road undercrossing and northbound widening of the South Tustin overhead.

Retaining Walls

In addition to the retaining walls described in Section 1.3.2, Alternative 4 would require the construction of retaining walls at the following locations:

- On northbound SR-55, between the westbound MacArthur Boulevard on-ramp and the Dyer Road off-ramp
- On the westbound Dyer Road on-ramp to northbound SR-55
- On northbound SR-55, just south of the Edinger Avenue undercrossing
- Two locations on northbound SR-55 between Edinger Avenue and McFadden Avenue
- On southbound SR-55, just north of the Dyer Road undercrossing
- On the southbound side of the Warner Avenue overcrossing

Drainage Facilities

In addition to the storm drain relocations described in Table 1.8, Alternative 4 would also require the relocation of the storm drain facilities described in Table 1.15.

Table 1.15 Alternative 4 Proposed Drainage Relocations

Size and Type of Facility	Location	Proposed Design
66" alternative pipe culvert 8-ft x 4-ft reinforced concrete box 63" alternative pipe culvert 60" alternative pipe culvert 54" alternative pipe culvert 42" alternative pipe culvert	Parallel to SB SR-55 from north of Dyer Rd to south of Edinger Ave	To be relocated farther west and join existing 54" alternative pipe culvert
8 ft x 4 ft reinforced concrete box	Parallel to NB SR-55 from south of McFadden Ave to north of McFadden Ave	To be relocated farther east and join existing 8 ft x 4 ft reinforced concrete box

Source: *Draft Preliminary Drainage Report* (2013).

Ave = Avenue NB = northbound SR-55 = State Route 55
ft = foot SB = southbound

Right of Way Acquisition

In addition to the right of way acquisitions described in Section 1.3.2, Alternative 4 would require the full acquisition of the same three parcels on southbound SR-55 just north of the Warner Avenue overcrossing and the one parcel on northbound SR-55 just south of the Warner Avenue overcrossing as Alternative 3. Alternative 4 would also require the partial acquisition of 14 parcels in addition to those acquisitions described in Section 1.3.2. The locations of the anticipated full and partial parcel acquisitions under Alternative 4 are shown later on Figure 2.3-5.

Design Exceptions (Advisory and Mandatory)

In addition to the design exceptions common to all the Build Alternatives, Alternative 4 would require 2 mandatory and 2 advisory design standards that would require design exceptions at one or more locations along the alignment of this alternative.

Utilities

In addition to the utility relocation and protection in place effects common to all the Build Alternatives listed earlier in Table 1.9, Alternative 4 would result in effects on additional utility facilities as listed in Table 1.16. Alternative 4 would require permanent utility easements on 7 parcels in addition to the 8 permanent utility easements common to all the Build Alternatives.

Table 1.16 Utility Relocations and Protection in Place Unique to Alternative 4

Utility Provider	Description and Location of Facility	Project Effect (Relocation or Protection in Place)
City of Santa Ana	3 fire hydrants 3 water service lines 3 fire service lines 5 valve cans 24" water line	Would be relocated along Pullman St between Dyer Rd and Warner Ave
		Would be relocated along Ritchey St on the west side of SR-55
Orange County Sanitation District	15" VCP sewer	Would be relocated along Ritchey St on the west side of SR-55
Southern California Edison	Pole anchor	Would be removed
	Wood pole	Would be replaced with steel pole
	Pole anchor	Would be removed
	Wood pole	Would be replaced with steel pole
Southern California Gas Company	3" gas line	Would be relocated along Pullman St on the east side of SR-55 between McGaw Ave and Duryea Ave
Time Warner	Telecom cables	Would be relocated
AT&T	Underground conduits	Would be relocated along Pullman St on the east side of SR-55

Source: *Draft Project Report* (2015).

Ave = Avenue

SR-55 = State Route 55

Blvd = Boulevard

St = Street

Rd = Road

VCP = vitrified clay pipe

Temporary Construction Easements

Alternative 4 would require a total of 49 TCEs; 38 would be on commercial and industrial parcels, 5 TCEs would be on residential parcels, 3 TCEs would be on flood control parcels, 2 TCEs would be on railroad parcels, 1 TCE would be on a vacant parcel.

Project Costs

The SR-55 Improvement Project would cost between approximately \$127.1 and \$250.8 million, depending on the alternative. The road, structure, right of way, and total costs for each Build Alternative are provided in Table 1.17. As noted earlier, this project is anticipated to be constructed with M2 funds. In addition, \$12 million in federal Regional Surface Transportation Project (RSTP) funds are available for final design.

Table 1.17 Summary of Costs by Alternative

Alternative	Right of Way Costs	Road Costs	Structure Costs	Total Costs
Alternative 1	\$51,978,631	\$71,100,000	\$4,028,000	\$127,107,000
Alternative 2	\$69,319,8966	\$120,700,000	\$8,010,000	\$198,030,000
Alternative 3	\$105,293,804	\$136,100,000	\$9,366,000	\$250,760,000
Alternative 4	\$92,724,138	\$116,300,000	\$7,494,000	\$216,519,000

Source: *Draft Project Report* (2015).

1.3.4 Construction Schedule

Construction of the project is anticipated to begin in mid-2019. Construction activities for Alternatives 1 and 2 are anticipated to be completed within approximately 30 months. Construction activities for Alternatives 3 and 4 are anticipated to be completed within approximately 36 months.

1.3.5 No Build Alternative

The No Build Alternative does not include improvements to the existing SR-55 mainline lane configuration (see Figure 1-8). This alternative does not preclude the construction of future improvements or general maintenance to improve the operation of the freeway mainline and ramp facilities or incorporate safety enhancements.

Population and job growth in Orange County anticipated by regionally adopted forecasts would result in increased traffic volumes on the project segment of SR-55. Without additional capacity, increases in traffic volumes on SR-55 would result in increased traffic congestion and delays, and degraded LOS.

The No Build Alternative is not consistent with the project purpose and need or the recommendations of the SR-55 Route Concept Report and the Project Study Report/Project Development Support (PSR/PDS) for the SR-55 Improvement Project. The purpose of describing and analyzing a No Build Alternative in this ED is to allow decision-makers to compare the impacts of approving the proposed project (a Build Alternative) with the impacts of not approving the proposed project (the No Build Alternative).

The No Build Alternative serves as the baseline against which to evaluate the effects of the Build Alternatives.

1.4 Comparison of Alternatives

Table 1.18 provides information for comparison of the four Build Alternatives and the No Build Alternative. The table summarizes the criteria used to evaluate the project alternatives, including design features, improvement in LOS, and environmental impacts. The criteria were developed by the Project Design Team (PDT) and will be used during selection of a preferred alternative for the proposed project.

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Table 1.18 Summary of Alternatives and Impacts

Evaluation Criteria		No Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	Build Alternative 4
Project Features and Design Standards						
Number of Lanes		1 HOV, 4 general-purpose	1 HOV, 4 general-purpose, and auxiliary	1 HOV, 5 general-purpose	1 HOV, 5 general-purpose, and auxiliary	2 HOV, 4 general-purpose
Travel Lanes consistent with the Caltrans Highway Design Manual?		Nonstandard general-purpose and HOV lanes	Standard general-purpose lanes and HOV lane	Standard general-purpose lanes and HOV lane	Standard general-purpose lanes and HOV lane	Standard general-purpose and HOV lane
Shoulders consistent with the Caltrans Highway Design Manual?		Non-standard HOV median shoulder, standard outside shoulder	Standard HOV median shoulder, standard outside shoulder, non-standard inside shoulders	Standard HOV median shoulder, non-standard outside shoulder, non-standard inside shoulders	Non-standard HOV median, non-standard outside shoulder, non-standard inside shoulders	Non-standard HOV median, non-standard outside shoulder, non-standard inside shoulders
Horizontal clearances consistent with the Caltrans Highway Design Manual?		Standard clearances are not provided for the inside median	Standard clearances are provided except bridge columns and median sign posts	Standard clearances are provided except bridge columns and median sign posts	Standard clearances are provided except bridge columns and median sign posts	Standard clearances are provided except bridge columns and median sign posts
Vertical clearances consistent with the Caltrans Highway Design Manual?		Minimum vertical clearances are provided	Minimum vertical clearance over LOSSAN rail corridor is not provided	Minimum vertical clearance over LOSSAN rail corridor is not provided	Minimum vertical clearance over LOSSAN rail corridor is not provided	Minimum vertical clearance over LOSSAN rail corridor is not provided
AM/PM peak-hour mainline LOS in 2040		E/F	E/F	D/F	D/F	D/F
Temporary construction easements		None	24	47	59	49
Project Cost		None	\$127,107,000	\$198,030,000	\$250,760,000	\$216,519,000
Construction Duration		None	30 months	30 months	36 months	36 months
Potential Environmental Impacts						
Land Use		Not consistent with applicable transportation and land use plans	Consistent with local, regional, and State plans Permanent loss of 8 parking stalls	Consistent with local, regional, and State plans Permanent loss of 8 parking stalls	Consistent with local, regional, and State plans Permanent loss of 20 parking stalls	Consistent with local, regional, and State plans Permanent loss of 20 parking stalls
Growth		No impact	Would not result in unplanned growth	Would not result in unplanned growth	Would not result in unplanned growth	Would not result in unplanned growth
Farmlands and Timberlands		No impact	No impact	No impact	No impact	No impact
Community Impacts	Community Character and Cohesion	No impact	Temporary impacts during construction, including 12 overnight ramp closures No long-term impacts	Temporary impacts during construction, including 19 overnight ramp closures No long-term impacts	Temporary impacts during construction, including 20 overnight ramp closures No long-term impacts	Temporary impacts during construction, including 19 overnight ramp closures No long-term impacts
	Relocation	No impact	Construction would require TCEs on 21 residential, commercial, and industrial parcels; 2 flood control parcels; and 1 railroad parcel.	Construction would require TCEs on 41 residential, commercial, and industrial parcels; 3 flood control parcels; 2 railroad parcels; and 1 public parcel.	Construction would require TCEs on 53 residential, commercial, and industrial parcels; 3 flood control parcels; 2 railroad parcels; and 1 vacant parcel.	Construction would require TCEs on 43 residential, commercial, and industrial parcels; 3 flood control parcels; 2 railroad parcels; and 1 vacant parcel.

Table 1.18 Summary of Alternatives and Impacts

Evaluation Criteria		No Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	Build Alternative 4
			Full acquisition of 4 vacant parcels and partial acquisition of 7 non-residential parcels, including the demolition of one occupied building, resulting in the displacement of one business (Rockin' Jump).	Full acquisition of 4 vacant parcels and partial acquisition of 16 non-residential parcels, including the demolition of one occupied building, resulting in the displacement of one business (Rockin' Jump).	Full acquisition of 8 non-residential parcels (including 2 business relocations) and partial acquisitions 30 non-residential properties (including the demolition of one occupied building), resulting in the displacement of one business (Rockin' Jump).	Full acquisitions of 8 non-residential parcels (including 2 business relocations) and partial acquisitions of 21 non-residential properties (including the demolition of one occupied building), resulting in the displacement of one business (Rockin' Jump).
	Environmental Justice	No impact	No disproportionate impact	No disproportionate impact	No disproportionate impact	No disproportionate impact
Utilities and Emergency Services		No impact	30 utility relocations and temporary emergency services delay during construction No long-term impacts	37 utility relocations and temporary emergency services delay during construction No long-term impacts	38 utility relocations and temporary emergency services delay during construction No long-term impacts	30 utility relocations and temporary emergency services delay during construction No long-term impacts
Traffic and Transportation		Long-term negative impact	Temporary impacts during construction Improved traffic operations and reduced congestion in the long term	Temporary impacts during construction Improved traffic operations and reduced congestion in the long term	Temporary impacts during construction Improved traffic operations and reduced congestion in the long term	Temporary impacts during construction Improved traffic operations and reduced congestion in the long term
Visual and Aesthetics		No impact	Temporary impacts during construction Permanent wall and landscaping enhancements	Temporary impacts during construction Permanent wall and landscaping enhancements	Temporary impacts during construction Permanent wall and landscaping enhancements	Temporary impacts during construction Permanent wall and landscaping enhancements
Cultural Resources		No impact	Potential to encounter unknown cultural resources during construction No long-term impacts	Potential to encounter unknown cultural resources during construction No long-term impacts	Potential to encounter unknown cultural resources during construction No long-term impacts	Potential to encounter unknown cultural resources during construction No long-term impacts
Hydrology and Floodplains		No impact	Minimal change to floodplain elevations	Minimal change to floodplain elevations	Minimal change to floodplain elevations	Minimal change to floodplain elevations
Water Quality and Storm Water Runoff		No impact	Construction activities would disturb a total area of 38.9 ac, resulting in temporary impacts during construction Permanent increase in impervious surface area of 7.3 ac, thereby increasing	Construction activities would disturb a total area of 70.3 ac, resulting in temporary impacts during construction Permanent increase in impervious surface area of 11.3 ac, thereby increasing	Construction activities would disturb a total area of 77.2 ac, resulting in temporary impacts during construction Permanent increase in impervious surface area of 15.4 ac, thereby increasing	Construction activities would disturb a total area of 64.9 ac, resulting in temporary impacts during construction Permanent increase in impervious surface area of 15.0 ac, thereby increasing

Table 1.18 Summary of Alternatives and Impacts

Evaluation Criteria	No Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	Build Alternative 4
		the volume of runoff and permanent improvement in water quality with project Treatment BMPs	the volume of runoff and permanent improvement in water quality with project Treatment BMPs	the volume of runoff and permanent improvement in water quality with project Treatment BMPs	the volume of runoff and permanent improvement in water quality with project Treatment BMPs
Geology, Soils, Seismic, and Topography	No impact	Temporary impacts during construction No substantial long-term impacts	Temporary impacts during construction No substantial long-term impacts	Temporary impacts during construction No substantial long-term impacts	Temporary impacts during construction No substantial long-term impacts
Paleontology	No impact	Potential to encounter unknown paleontological resources during construction No long-term impacts	Potential to encounter unknown paleontological resources during construction No long-term impacts	Potential to encounter unknown paleontological resources during construction No long-term impacts	Potential to encounter unknown paleontological resources during construction No long-term impacts
Hazardous Wastes and Materials	No impact	Soil contaminants and structural materials may be encountered during construction No long-term impacts	Soil contaminants and structural materials may be encountered during construction No long-term impacts	Soil contaminants and structural materials may be encountered during construction No long-term impacts	Soil contaminants and structural materials may be encountered during construction No long-term impacts
Air Quality	No impact	Temporary impacts during construction No substantial long-term impacts	Temporary impacts during construction No substantial long-term impacts	Temporary impacts during construction No substantial long-term impacts	Temporary impacts during construction No substantial long-term impacts
Noise	No impact	Temporary impacts during construction No perceptible increase in noise in the long-term increase The following noise barriers were determined to be reasonable and feasible: <ul style="list-style-type: none"> NB No. 3 Combined NB No. 3 Reduced and NB No. 4 	Temporary impacts during construction No perceptible increase in noise in the long-term increase The following noise barriers were determined to be reasonable and feasible: <ul style="list-style-type: none"> NB No. 3 Combined NB No. 3 Reduced and NB No. 4 	Temporary impacts during construction No perceptible increase in noise in the long-term increase The following noise barriers were determined to be reasonable and feasible: <ul style="list-style-type: none"> NB No. 3 Combined NB No. 3 Reduced and NB No. 4 	Temporary impacts during construction No perceptible increase in noise in the long-term increase The following noise barriers were determined to be reasonable and feasible: <ul style="list-style-type: none"> NB No. 3 Combined NB No. 3 Reduced and NB No. 4

Table 1.18 Summary of Alternatives and Impacts

Evaluation Criteria	No Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3	Build Alternative 4
Natural Communities	No impact	No impact	No impact	No impact	No impact
Wetlands and Other Waters	No impact	1.01 ac of temporary impacts to USACE and CDFG jurisdiction No permanent impacts to USACE jurisdiction. 0.93 ac of permanent impacts to CDFW jurisdiction	1.01 ac of temporary impacts to USACE and CDFG jurisdiction No permanent impacts to USACE jurisdiction. 0.93 ac of permanent impacts to CDFW jurisdiction	1.01 ac of temporary impacts to USACE and CDFG jurisdiction No permanent impacts to USACE jurisdiction. 0.93 ac of permanent impacts to CDFW jurisdiction	1.01 ac of temporary impacts to USACE and CDFG jurisdiction No permanent impacts to USACE jurisdiction. 0.93 ac of permanent impacts to CDFW jurisdiction
Plant Species	No impact	No impact	No impact	No impact	No impact
Animal Species	No impact	Potential for temporary impacts during construction to burrowing owls, migratory birds, bats, and other bridge- and crevice-nesting special-status species No long-term impacts	Potential for temporary impacts during construction to burrowing owls, migratory birds, bats, and other bridge- and crevice-nesting special-status species No long-term impacts	Potential for temporary impacts during construction to burrowing owls, migratory birds, bats, and other bridge- and crevice-nesting special-status species No long-term impacts	Potential for temporary impacts during construction to burrowing owls, migratory birds, bats, and other bridge- and crevice-nesting special-status species No long-term impacts
Threatened and Endangered Species	No impact	No impact	No impact	No impact	No impact
Invasive Species	No impact	No impact	No impact	No impact	No impact
Cumulative Impacts	No impact	No impact	No impact	No impact	No impact
Climate Change	No temporary impacts Increase in CO ₂ emissions of 60 tons/day in 2020 and 500 tons/day in 2040 compared to existing (2011) conditions	Temporary impacts during construction Increase in CO ₂ emissions of 10 tons/day in 2020 and 20 tons/day in 2040 compared to the No Build Alternative	Temporary impacts during construction Increase in CO ₂ emissions of 10 tons/day in 2020 and 30 tons/day in 2040 compared to the No Build Alternative	Temporary impacts during construction Increase in CO ₂ emissions of 20 tons/day in 2020 and 50 tons/day in 2040 compared to the No Build Alternative	Temporary impacts during construction Increase in CO ₂ emissions of 10 tons/day in 2020 and 30 tons/day in 2040 compared to the No Build Alternative

Source: LSA Associates, Inc. (2015).

Note: Long-term impacts are equivalent to permanent impacts.

ac = acres

BMPs = best management practices

CDFW = California Department of Fish and Wildlife

GHG = greenhouse gas

HOV = high-occupancy vehicle

LOS = levels of service

LOSSAN = Los Angeles to San Diego

TCE = temporary construction easement

USACE = United States Army Corps of Engineers

After the public circulation period, all comments will be considered, and Caltrans will select a preferred alternative and make the final determination of the proposed project's effect on the environment. Under CEQA, if no unmitigable significant adverse impacts are identified, Caltrans will prepare a Mitigated Negative Declaration (MND). Similarly, if Caltrans determines the action does not significantly impact the environment, Caltrans, as assigned by FHWA, will issue a Finding of No Significant Impact (FONSI) in accordance with NEPA.

1.5 Alternatives Considered but Eliminated from Further Consideration

Analysis of the proposed project provided a comprehensive study of design solutions that were considered for addressing the need for improvements along the project segment of SR-55. The following transportation concepts were evaluated and eliminated from further consideration based either on impacts to resources, feasibility, ability to meet the purpose and need, and/or cost.

1.5.1 PSR/PDS Alternative 4

The PSR/PDS (2008) for the proposed project evaluated a Build Alternative (PSR/PDS Alternative 4) that would have added one additional general-purpose lane and one additional HOV lane in each direction on the project segment of SR-55, and an auxiliary lane on northbound SR-55 between the I-405 connector and the Edinger Avenue on-ramp and on southbound SR-55 between the I-5 connectors and the I-405 connectors.

PSR/PDS Alternative 4 was removed from further consideration during the PSR/PDS phase due to extensive right of way impacts on existing commercial buildings adjacent to SR-55. Those impacts would result in substantial business disruptions and relocations, which would not be a feasible solution to address the traffic demand.

This alternative was also considered during the Project Approval/Environmental Documentation (PA/ED) phase because the Alton Avenue Overcrossing Project would no longer have drop lanes considered as part of Alternative 4 (PSR). This would reduce the project's impacts and possibly make it a feasible alternative. However, the impacts would only be reduced in the area of the proposed drop ramps and was not enough of an impact reduction to continue with evaluation and consideration of this alternative.

1.5.2 Closure of McFadden Avenue Northbound On- and Off-Ramps

The complete closure of the McFadden Avenue northbound on- and off-ramps was considered to address the problem of weaving distance on SR-55 for traffic merging from the McFadden Avenue northbound on-ramp. Closing the ramps would prevent drivers from weaving over to stay on SR-55, thereby preventing the congestion and decreasing the accident rate in this area. As a result of the closure, access from the McFadden Avenue on-ramp to northbound SR-55 and northbound and southbound I-5 would be eliminated. In addition, access from northbound SR-55 to McFadden Avenue would also be eliminated. This option was removed from consideration because of the volume impacts of closing the ramps. The existing traffic would dissipate into the local system and create a substantial traffic volume impact throughout the area. This impact would increase the envelope and the impacts of the project; therefore, this design variation was considered infeasible.

1.5.3 Transportation Systems Management, Transportation Demand Management, and Transit Alternatives

Alternative travel modes were considered during the early planning studies for improvements to SR-55. TSM strives to maximize the efficiency of the existing system through operational modifications such as ridesharing, reversible lanes, ramp metering, and traffic-signal optimization. The TSM strategy is to improve traffic flow and increase the number of vehicle trips without changing the number of through lanes on a road. Transportation Demand Management (TDM) focuses on the demand side of travel behavior with regional strategies for reducing the number of vehicle trips and vehicle miles traveled, and increasing vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation choice through initiatives such as telecommuting and changing work schedules to produce a more even pattern of transportation network use, muting the effect of morning and evening rush hours. In addition, multi-modal transportation alternatives integrate multiple transportation modes, such as pedestrian, bicycle, automobile, rail, and mass transit.

TSM, TDM, and multi-modal transportation strategies have been and would continue to be provided in the SR-55 corridor area. As discussed in Section 1.1.1, Existing Facility, the existing on-ramps along the project segment of SR-55 are all currently metered. Several bus routes operate on SR-55 and the surrounding areas. All four Build Alternatives would maintain the existing ramp metering and would not permanently impact the bus lines. In addition, there is currently one HOV lane in each direction that operates with continuous access. Alternatives 1, 2, and 3 would

maintain the existing HOV lane and would extend the transition length for merging between the existing southbound HOV lane on SR-55 and the southbound I-5/SR-55 Connector HOV lane past Edinger Avenue. Alternative 4 proposes to add a second HOV lane in each direction between the I-405 and I-5 HOV direct connectors.

TSM, TDM, and mass transit alternatives alone do not satisfy the proposed project purpose of improving both existing and future mobility, reducing congestion, and improving mainline weaving, merge, and diverge movements, and would not fulfill OCTA's Freeway Chokepoint Program. As a result, these alternatives were withdrawn from further consideration and are not evaluated in detail in this ED.

1.5.4 Full Standard Alternative

A full standard Build Alternative, with no mandatory or advisory design exceptions, was considered during the early planning studies for improvements to SR-55. A full standard alternative would not be cost effective, would require extensive rebuild of the existing freeway, and would have extensive right of way impacts. As a result, this alternative was withdrawn from further consideration and is not evaluated in detail in this ED.

1.6 Permits and Approvals Needed

The proposed project is anticipated to require the permits, reviews, and approvals listed in Table 1.19 on the following page.

Table 1.19 Permits and Approvals Needed

Permit/Approval	Agency	Status
Encroachment Permit for the LOSSAN rail corridor	OCTA, owner of the LOSSAN rail corridor right of way	Coordination between Caltrans and OCTA for this encroachment permit will occur prior to any project construction.
NPDES Construction General-Permit Order No. 2009-009-DWQ, NPDES No. CAS000003 (Section 402 of the CWA)	SWRCB	The Permit Registration Documents, including the NOI, will be submitted to the SWRCB and the WDID received prior to any project construction.
Caltrans NPDES Permit Order No. 2012-0011-DWQ No. CAS000002 (Section 402 of the CWA)	SWRCB	Permit issued to Caltrans on September 19, 2012, for discharges from State right of way.
Watershed Streambed Alteration Agreement	CDFW	A Watershed Streambed Alteration Agreement is anticipated to be needed for this project because the project is expected to be found consistent with the San Diego Creek Watershed SAMP after consultation with the resources agencies.
Streambed Alteration Agreement (Fish and Game Code Section 1601)	CDFW	A Streambed Alteration Agreement and not a Watershed Alteration Agreement would be needed for this project if the project is found to be inconsistent with the San Diego Creek Watershed SAMP after consultation with the resources agencies.
Water Quality Certification (Section 401 of the CWA)	Santa Ana RWQCB	A Section 401 Water Quality Certification is not anticipated to be needed for this project unless the project is found not to be consistent with the San Diego Creek Watershed SAMP after consultation with the resources agencies.
Letter of Permission	Corps	A Letter of Permission is anticipated to be needed for this project because the project is expected to be found consistent with the San Diego Creek Watershed SAMP after consultation with the resources agencies.
Individual Permit (Section 404 of the CWA)	Corps	An Individual Permit and not a Letter of Permission would be needed for this project if the project is found not to be consistent with the San Diego Creek Watershed SAMP after consultation with the resources agencies. This permit would be required if the project involves the discharge of fill into or alterations to the Lane Channel or the Santa Ana/Santa Fe Channel.
Encroachment permit for work at Lane Channel	OCFCD	Coordination between Caltrans and OCTA for this encroachment permit will occur prior to any project construction.
Certificate of Public Convenience and Necessity (CPCN)	Public Utilities Commission	During final design, a permit will be obtained by Southern California Edison for the required overhead transmission relocation work.

Caltrans = California Department of Transportation
 CDFW = California Department of Fish and Wildlife
 Corps = United States Army Corps of Engineers
 CWA = Clean Water Act
 LOSSAN = Los Angeles to San Diego
 NOI = Notice of Intent
 NPDES = National Pollutant Discharge Elimination System

OCFCD = Orange County Flood Control District
 OCTA = Orange County Transportation Authority
 RWQCB = Regional Water Quality Control Board
 SAMP = Special Area Management Plan
 SWRCB = State Water Resources Control Board
 WDID = Waste Discharger Identification